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GO WORLD NO.

小栗の事清く鏡鑑めて千餘暇に
長やうきもの今さらうた
及もて照天が貞人のいさ
ほふふおれね常陸
の海にわくいのちも
人よりうきはなれ
まじとふ感むる涙
滴るを襟と浸さぬ
ものもはひの學者と
貞と鬼とわく幾多
せむらうの行なるうた

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CONTENTS

Go World News	2
A Commemoration of Dr. Yang Liansheng's Contribution to Goe Rules, Part One	7
A Comparison of the New Ko Rules	13
The 5th Tong Yang Securities Cup Final: Lee Chang-ho v. Cho Chikun	19
Michael Redmond's Tong Yang Triumph	31
The 6th Fujitsu Cup: Yang v. Takemiya	35
The 7th Fujitsu Cup	38
Korean Go: The Age of Lee	47
Play Moves with a Purpose	57
A Taste for Thickness	57
The Solution to the \$1,000-Ko Problem	65

Cover: Oguri Hangan on Horseback. An oban print by Kunisada (signing as Toyokuni III), published by Joshuya Kinzo, 1844-46. Oguri Hangan Daisukeshige (1398-1464) was the son of a provincial lord who had been dispossessed of his estates by the Ashikaga clan. He led an adventurous life when young, but eventually settled down and became a noted painter. He was famous for his horsemanship and was reputed to be able to make a horse stand with all four hooves on a go board. The small scene at the upper left, signed by the artist's pupil Kunimasa, presumably shows the Oguri family's arch-enemy, the Ashikaga Shogun Yoshimitsu.

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Go World News

International Go

Cho Hun-hyun Wins 5th Tong Yang Cup

Yoda Norimoto has become known and feared in Korea as 'the Korean killer' for his outstanding results against Korean players in international tournaments, but he met his match in the final of the 5th Tong Yang Securities Cup. Yoda was outplayed both on and off the board.

In the first game of the best-of-five final, played in Pusan on 16 May, Yoda allowed himself to be upset by Cho's constantly humming to himself; what made it worse — harder to ignore? — for Yoda was that the songs were Japanese (Cho spent nine years in Japan). According to report, rather than being a psychological ploy devised for Yoda's benefit, this humming is a habit of Cho's.

The result was that Yoda couldn't concentrate, and the earplugs he brought along for the second game (18 May) didn't help, so he got off to a bad start with two losses.

Yoda made a brief recovery, winning the third game, played in Seoul on 20 June, but lost the fourth (22 June), to give Cho his second international title. First prize was 100 million won.



Two international titles for Cho — the Korean juggernaut rolls on.

Cho Wins 7th Fujitsu Cup

The all-Korean final of the 7th Fujitsu Cup was a replay of the previous year's final, but the result was reversed, with Cho Hun-hyun picking up his second international title in a row. He defeated the 1993 winner Yoo Chang-hyeok.

After the first two rounds, the tournament had seemed to be going very well for Japan, with all the Japanese title-holders except Otake Judan represented in the quarterfinals. However, it was the two Koreans who won their way through to the final.

Full results (continuing from GW70):

Quarterfinals (played in Kyongju, Korea on 3 June). Yoo beat Kobayashi Koichi, Cho Chikun b. Zhang Wendong (China), Rin b. Hua Xueming (China), Cho Hun-hyun b. Kato. (Note: the Korean TV coverage enjoyed 20% ratings.)

Semifinals (Osaka, 2 July). Yoo b. Cho Chikun, Cho Hun-hyun b. Rin.

Final (Tokyo, 6 August). Cho b. Yoo. Rin b. Cho Chikun in the playoff for third place.

With this win, Cho became the first player to have won all three international tournaments: Ing, Fujitsu, and Tong Yang. That gives him a strong claim to be the world's top player.

China Wins 7th Tengen Playoff

After losing the first four of these playoffs, the Chinese have now won the last three. The hero this year for China was Ma Xiaochun, who was making his first appearance in this playoff. He defeated the Japanese Tengen, Rin Kaiho, 2-0 (the games were played on 15 and 17 June.)

This victory was the first good news for China in international go for quite a while. With one win each in the Japan-China Tengen and Meijin playoffs, Ma has made up a little for his otherwise lacklustre results in international tournaments.

Otake Wins 6th TV Asia Cup

One of the few bright spots on the international scene for Japan recently has been its



Ma defeats Rin in the 7th Japan-China Tengen Playoff.

domination of the TV Asia Cup. Takemiya won the title for its first four years, Yoda starred last year, and this year it was the turn of Otake Hideo.

The TV Asia Cup is open to the finalists in Japan's NHK Cup, China's CCTV Cup, and Korea's KBS Cup, with an extra place for the previous year's winner, if he is not one of the above. This year it was held in Pusan in Korea from 19 August to 23 July.

With go enjoying an extraordinary boom in popularity in Korea, the semifinals and final were telecast live, but ironically both Korean participants had been eliminated in the first round, which must have affected the TV ratings. Kato Masao took revenge on Cho Hun-hyun for two successive losses in the Fujitsu Cup and Qian Yuping of China disposed of Yoo Chang-hyeok. In the other game, Otake defeated Ma Xiaochun of China.

In the semifinals, Yoda lost to Qian and Kato to Otake. In the final, Otake scored a convincing win against Qian. The latter was actually making his international comeback and scored his second second place in an international tournament. The difference is that in the previous one, the 1991 Fujitsu Cup, he forfeited the final to Cho Chikun because of illness.

Score Tied in 9th Super Go

After Japan won the first game (Yamada Kimio beat Chang Hao on 23 March 1994), China took the lead, with Liu Xiaoguang 9-dan defeating Yamada (25 March), Komatsu Hideki (27 April), and Yoda Norimoto (29 April). The Chinese strategy of fielding Liu, the number three player on the mainland, as the second player on their six-man team seemed to be paying off handsomely, but then Yamashiro Hiroshi redressed the balance by defeating Liu (30 July) and Chen Linxin (1 August). That tied the score 3-3.

Japan Wins WAGC

Hiraoka Satoshi of Japan won the 16th World Amateur Go Championship, held in Kyoto from 24 to 27 May, with a perfect 8-0 score. Aged 23 and a university student, Hiraoka is the first member of the younger generation to represent Japan and he is the first Japanese to win the tournament without dropping a game. Japan has now won the tournament five times to China's ten.

Some Western players put up very creditable performances, as the list of prize winners shows.

1. Hiraoka (Japan) 8-0
2. Chou Chun Hsun (Chinese Taipei) 7-1



Kataoka gives Cho a scare by winning the sixth game to even the Honinbo series.

3. Wang Cun (China) 6-2
4. Kim Se Hyun (Korea) 6-2
5. John Lee (U.S.A.) 6-2
6. Robert Mateescu (Romania) 6-2
7. Ivan Detkov (Russia) 5-3
8. Andras Gondor (Hungary) 5-3.

Robert Mateescu, who has studied as an *insei* at the Nihon Ki-in, became the second Westerner, after Ronald Schlemper, to score a win over one of the Far Eastern big three when he defeated Kim of Korea in the sixth round. Michael Redmond's commentary on that game will be presented in the comprehensive report on the tournament to be featured in the 1995 *Ranka Yearbook*.

News from Japan

Cho Defends 49th Honinbo Title

Cho Chikun won his sixth Honinbo title in a row by defeating Kataoka Satoshi 4-3. As the score indicates, Kataoka, playing in his first best-of-seven (which also means his first two-day games), turned out to be a very tough challenger. Cho has seemed to be running away with the match when he took

a 3-1 lead, but Kataoka gave him a scare by winning the fifth and sixth games. When Cho blundered away a won position in the sixth game, he suddenly looked very fragile, but he turned on the power to score a convincing win in the decider.

After Kobayashi's failure (in the Kisei title) to break Takagawa's record of nine titles in a row, Cho is now sneaking up on it. His tally of eight Honinbo titles in total already puts him in second place in the big-title stakes (equal to Kobayashi's Kisei swag). Cho has also extended his record in best-of-seven titles matches to an impressive 17 victories (including all five of his challenges) to just three defeats.

The results:

- Game 1 (9, 10 May). Kataoka (B) won by 2½.
- Game 2 (25, 26 May). Cho (B) by resig.
- Game 3 (9, 10 June). Cho (W) by 6½.
- Game 4 (15, 16 June). Cho (B) by resig.
- Game 5 (29, 30 June). Kataoka (B) by resig.
- Game 6 (12, 13 July). Kataoka (W) by resig.
- Game 7 (21, 22 July). Cho (B) by 3½.

50th Honinbo League

The new members of the league are Kato Masao (who defeated Rin Kaiho in the final

preliminary round — this was the 99th game between the two; Rin leads 52–47), Yuki Satoshi (making an immediate comeback after dropping out), Yo Kagen (a Taiwanese player making his debut in the league), and Kobayashi Koichi (rejoining the league after missing a year).

Rin Takes Gosei Title

1994 is turning out to be a tough year for Kobayashi Koichi. After losing the Kisei title to Cho Chikun and having his Judan challenge rebuffed by Otake Hideo, he next lost his Gosei title to Rin Kaiho. That ended Kobayashi's reign as Gosei at six years.

The title match started ominously for Rin when he lost the first game, following on from his 0–3 drubbing in the same title last year. However, he then took revenge for past setbacks by winning three games in a row. He thus became a double title holder for the first time for many years. Kobayashi, on the other hand, is down to just one title for the first time in six years.

The results:

Game 1 (8 July). Kobayashi (W) won by 6½.

Game 2 (16 July). Rin (W) by 5½.

Game 3 (28 July). Rin (B) by 1½.

Game 4 (10 August). Rin (W) by 5½.

Rin Challenges for 19th Meijin Title

Rin has been the in-form player in Japanese tournaments this summer. On top of winning the Gosei title, he also won the Meijin league and is now engaged in the fifteenth Meijin title match of his career.

In this year's Meijin league, Kataoka made the early running with four straight wins, but then he faded, leaving Rin, Cho, and Kato to share a tie for first place (they all scored 6–2). Unfortunately for Kato, only the top two ranked players qualify for a playoff. Rin defeated Cho on 15 August to earn the right to a return match against Kobayashi (he lost 1–4 to him in 1991).

Late news. The first game, played on 7 and 8 September, was won by Kobayashi (W) by 2½ points.

Death of Hashimoto Uтарo

With the death of Hashimoto Uтарo, a great player who has experienced at first hand virtually the whole history of 20th century Japanese go has passed from the scene but not before setting a perhaps unchallengeable record for longevity as a go player.

Hashimoto died of a burst aortic aneurysm at 1:30 p.m. on 24 July 1994 at his home in Kobe. Fittingly, he was watching the NHK go program, on which his final game commentary was broadcast on 31 July. Hashimoto also ended his playing career on the right note, winning the last game he played, on 18 May. (Ironically, that was his first game ever with Okabe Hiroaki 6-dan, who had joined him in founding the Kansai Ki-in in 1950 but had never encountered him in a tournament.)

Born on 27 February 1907, Hashimoto became a professional in 1922, so his go career lasted 72 years. Hayashi Yutarō had

19th Meijin League

Title-holder: Kobayashi Koichi

Rank	Name	O	C	T	Y	R	K	S	A	K	Score	Place
1	Otake	—	0	0	1	0	0	1	1	0	3–5	—
2	Cho Chikun	1	—	1	1	0	1	1	0	1	6–2	2
3	Takemiya	1	0	—	1	1	0	1	0	0	4–4	5
4	Yoda	0	0	0	—	1	0	1	0	0	2–6	—
5	Rin Kaiho	1	1	0	0	—	1	1	1	1	6–2	1
6	Kato	1	0	1	1	0	—	1	1	1	6–2	3
7	Sato	0	0	0	0	0	0	—	0	0	0–9	—
7	Awaji	0	1	1	1	0	0	1	—	0	4–4	6
7	Kataoka	1	0	1	1	0	0	1	1	—	5–3	4

Note: The players are ranked according to their results in the previous league.

Note 2: Rin defeated Cho in a playoff.

previously held the record for oldest active player (he died at 83), but Hashimoto beat him by four years. Ironically, he had planned to retire if he won the 1st Kisei title match, way back in 1977, when he was just 69! In his own words, he must have 'angered the god of go', who made him lose to Shuko.



Hashimoto Utao
(Photo from about a decade ago)

Hashimoto's achievements are too numerous to list here (refer to *The Go Player's Almanac* for details), but he will always be remembered for playing in the atom-bomb game and for his come-from-behind triumph over Sakata in the 1951 Honinbo title match. He was also probably the most prolific *tsume-go* (life-and-death problem) composer ever. It was his practice to compose a problem a day every day (including the morning of his death), and his compositions were published daily in the Osaka Yomiuri for 40 years. That's an impressive achievement, considering that his problems were noted for being original, not rehashes of classical problems.

Hashimoto disliked pomp and his will decreed that there be no funeral service. His memorial, of course, is the thriving institution he founded, the Kansai Ki-in, with its 130 members.

19th Kisei Tournament

Players in the running to challenge Cho Chikun for the 19th Kisei title are Rin Kaiho and Kobayashi Koichi, who will meet in one semifinal, and Kato Masao and either Kudo Norio or Kobayashi Satoru, who will meet in the other.

This year the *paramasu* system was abandoned in favour of a straight knockout tournament between the winners of the lower dan sections. The winner was Imamura Yoshiaki 7-dan of the Nagoya branch of the Nihon Ki-in, who won one of the 11 places in the final stage. Full results follow (note that five players start in the second round).

Round 1. Kobayashi Satoru 9-dan beat Morita Michihiro 7-dan, Kato Masao Oza b. Otake Hideo Judan, Imamura Yoshiaki b. Yuki Satoshi 8-dan.

Round 2. Kato b. Hane Yasumasa 9-dan, Kobayashi Koichi Meijin b. Hikosaka Naoto 9-dan, Rin Kaiho Tengen b. Imamura. One game, Kobayashi Satoru v. Kudo Norio 9-dan, is still to be played.

1994 Promotions

The following players, among others, have earned promotions in this year's rating tournament (*Oteai*):

To 9-dan: Yokoyama Kunitada, Fukui Susumu, Aragaki Takeshi

To 8-dan: Hidaka Toshiyuki, Komatsu Fujio, Aoki Shinichi, Komatsu Fujio

To 7-dan: Yo Kagen

To 6-dan: Aoki Kikuyo

Complete Games of Fujisawa Shuko

The complete games of Fujisawa Shuko are scheduled to be published in December this year in 12 deluxe volumes bound Japanese style. This is a limited edition of 900 copies. Anyone interested in the over 1,300 games Shuko has left for posterity should contact the Nihon Ki-in (7-2 Gobancho, Chiyoda-ku, Tokyo 102). The publication is one of the events commemorating the 70th anniversary of the founding of the Nihon Ki-in and during this year it will be available at the discount price of ¥230,000 (normal price ¥270,000) plus postage.

Shuko is the third player, after Takagawa

Continued on page 34

A Commemoration of Dr. Yang Liansheng's Contribution to Goe Rules, Part One

by Ing Chang-Ki

I met Dr. Yang Liansheng twice. The first time was in the fall of 1961. I was the leader of the American Banking Business Inspection Team and had a chance to travel to Boston. We got together at Harvard University, played a game and had a beer together. At that time I learned that he was an expert in Chinese history and that he had also done quite a bit of research on the various scoring systems of Goe. The second time we met was in 1986 or 1987. He came to Taipei for a conference and he dropped by at the Ing Chang-Ki Goe Educational Foundation for a visit. We talked for a few minutes.

In 1956, Dr. Yang wrote an essay called *An Investigation of the Evolution of the Counting Method of Wei-ch'i*. This article was written in response to an invitation from the famous Korean historian Dr. Lee Bing Tai. It was translated into Japanese by Go Seigen and was then published in the November 1960 issue of *Kido*. In a footnote, Go Seigen acknowledged, 'This article was mailed to me by Dr. Yang Liansheng in 1957.' The chief editor of *Wei-ch'i* magazine (Taiwan), Mr. Sha Jiguan, translated this article back into Chinese and published it in the November and December issues of 1960. In September the following year, Dr. Sun Junshan mailed a copy of the original Chinese article to Mr. Sha Jiguan. This paper was then republished in *Wei-ch'i* magazine (Vol. 6, No. 9). The following section on the evolution of the counting method was extracted from that article:

The game of Wei-ch'i has been very popular in China, Korea and Japan. However, the methods used in the scoring of the game are slightly different. According to the Chinese method, the number of stones of one of the players is counted. This includes the stones and the vacant points (which are also counted as stones) surrounded by the live groups. One then compares this number with half the total possible points obtainable on the board to

determine the winner. As for the Koreans and Japanese, they don't count the stones and only compare vacant points (i.e., eyes, also known as 'lu'). This method requires that the captured stones be filled into the vacant points of the same color. The two methods look very different. Actually, with two vacant points equal to one stone, the results are identical. [A note from Ing: the results are not always identical, they are just approximately the same.] There are also other minor differences in the rules that are outside the scope of this article.

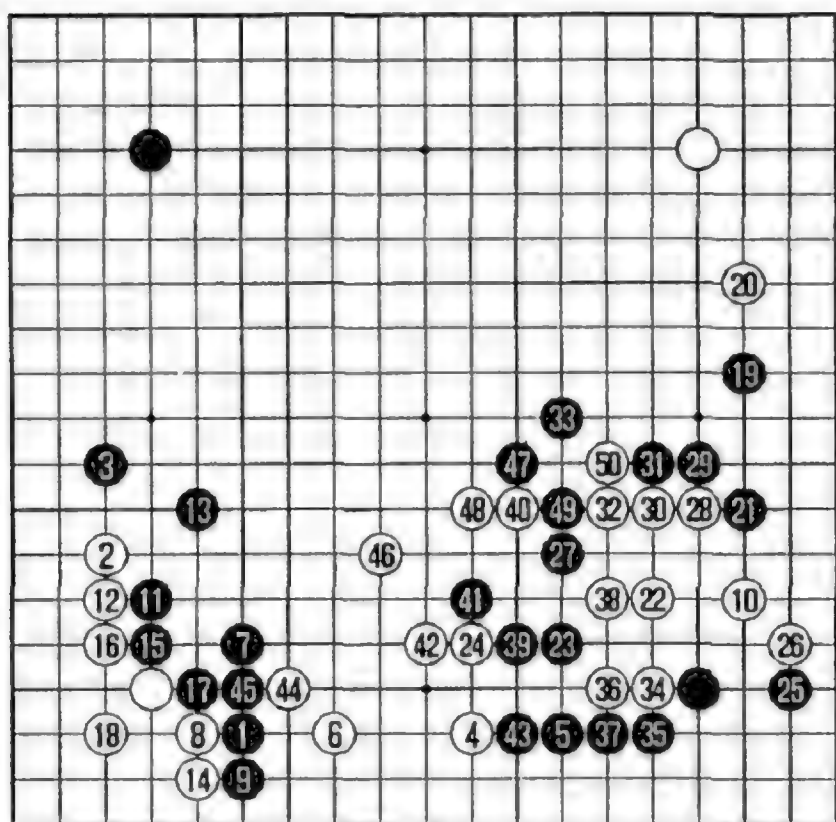
One might assume that the Chinese have always been counting stones only. This is not true. The Chinese used to count vacant points, but later switched to counting stones. This old system of comparing vacant points was introduced into Korea and Japan during the Nanbei Dynasty (420-589 A.D.). The history of Goe in these two countries is first mentioned in *Zhoushu Yiyu Chuan Baiji* (Baiji was an ancient Chinese name for Korea), *Suishu Dongyi Chuan Baiji*, *Woguo* (Woguo was an ancient Chinese name for Japan), and *Beishi Baiji Zhuan*, *Woguo Zhuan*. According to the findings of my brief research, the Chinese changed their counting method during the early period of the Ming Dynasty (1368-1644 A.D.). By the end of Emperor Shen-Zong's (Wan-Li) kingdom, the stone-counting method had already become quite popular.

Before and during the Song Dynasty (920-1279 A.D.), the Chinese counting method compared vacant points, called 'lu'. The Japanese call them 'mu' (or 'moku' in Japanese), and the Koreans call them 'hu' (meaning 'house'). All three refer to vacant points. This was clearly indicated in *Wang You Qing Le Ji*, written by Li Yimin (based on a reproduced copy produced by Xu Naichang of Nanling). Li was a Goe official whose sole duty was to entertain and play Goe with the Emperor Wei-Zong. The book got its name because Wei-Zong once wrote a poem which said 'Wang You Qing Le

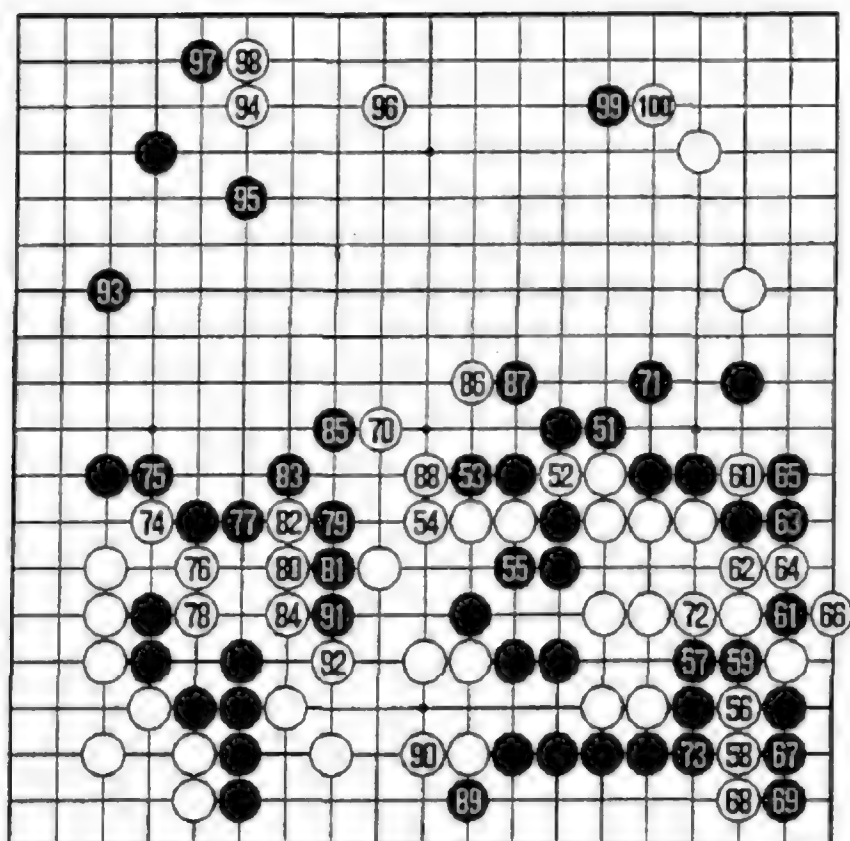
Zai Qi Ping', which means that one can forget one's troubles and have fun while playing Go. The phrase 'Wang You' also appears in *Jinshu* (Zuna Zhuan). There are four records of complete games in this book. At the end of each game, the result is clearly indicated.

Game One: 'Chengdufu Si Xianzi Tu' (The Four Fairies Diagram)

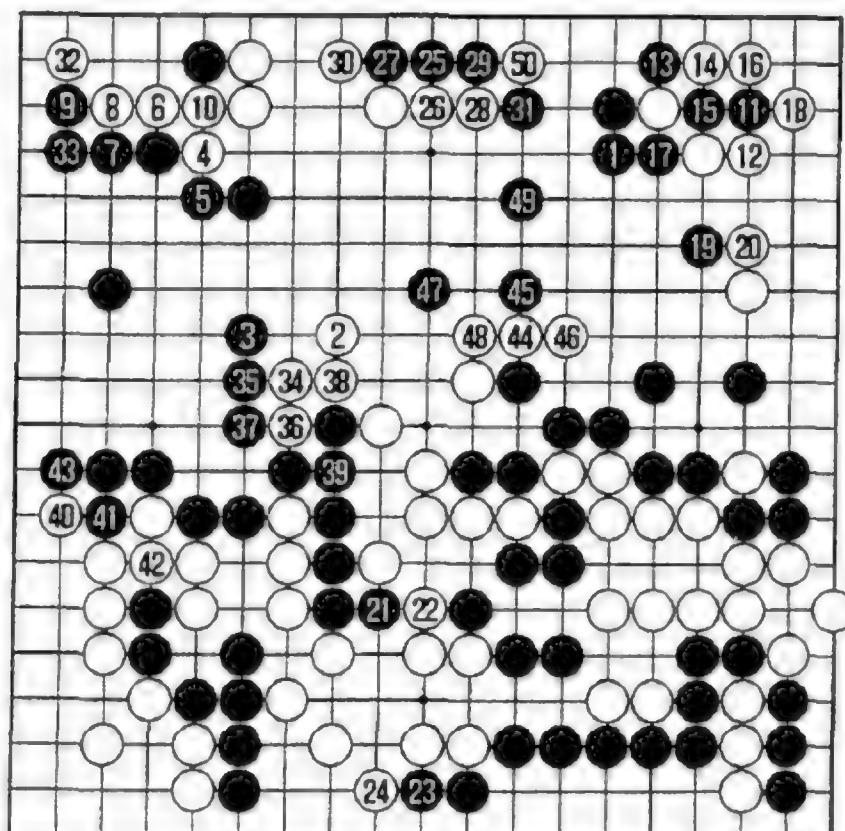
This was a pair game played by four famous players of the Song Dynasty. Result: White captured 9 black stones and had 43 'lu'. Black captured 7 white stones and had 42 'lu'.



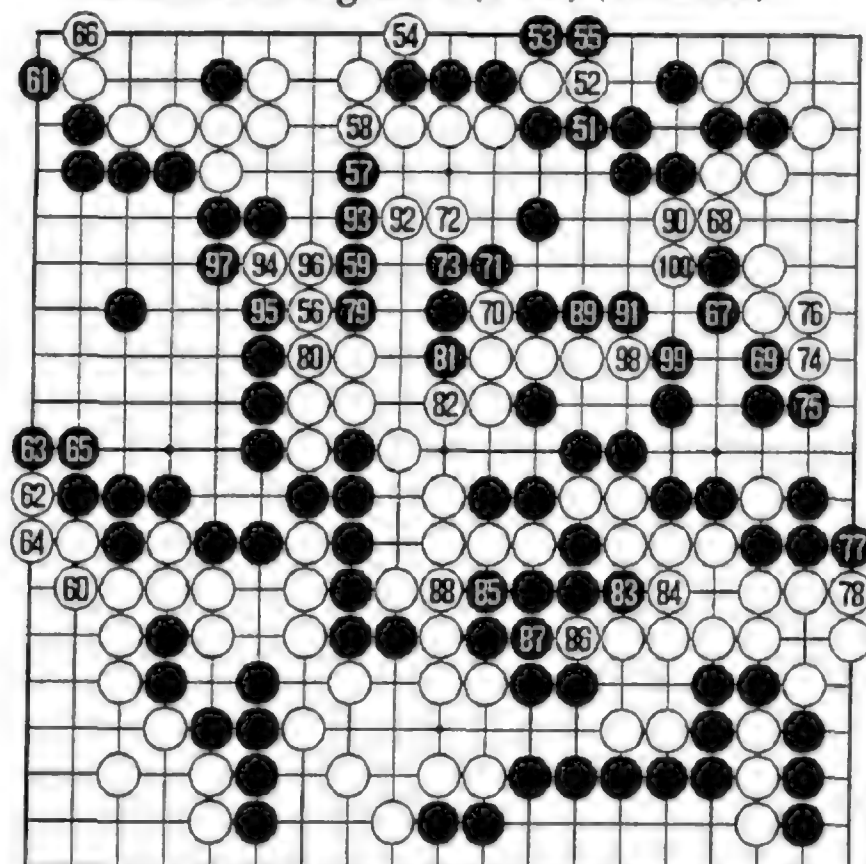
Game One: Diagram 1 (1-50)



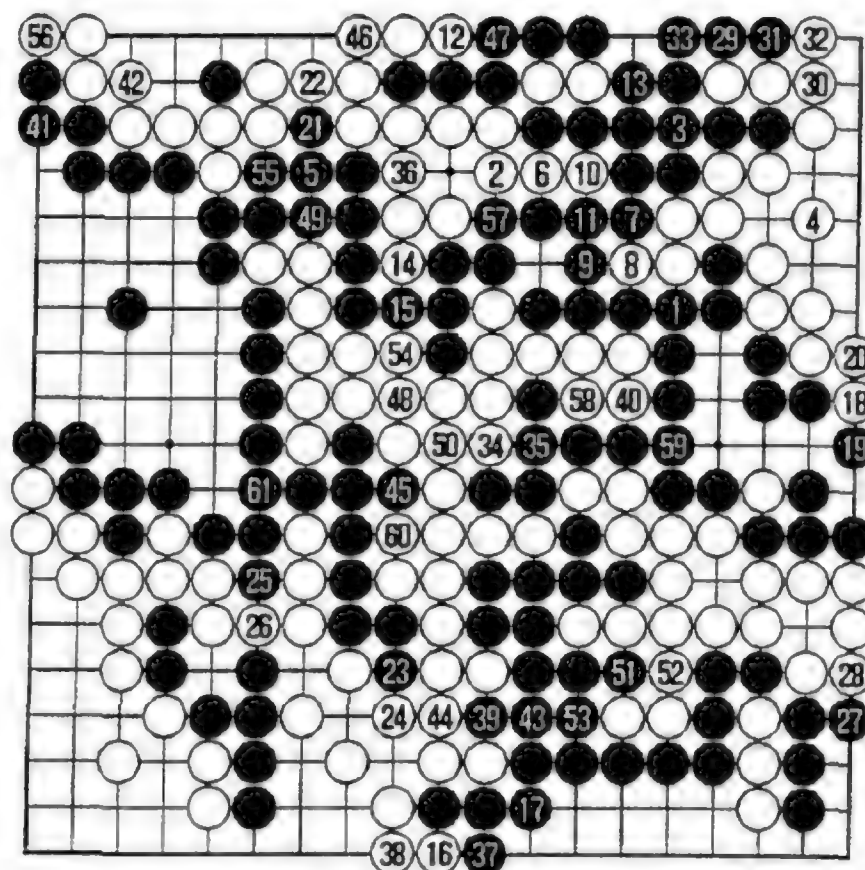
Game One: Diagram 2 (51-100)



Game One: Diagram 3 (1-50) (101-150)



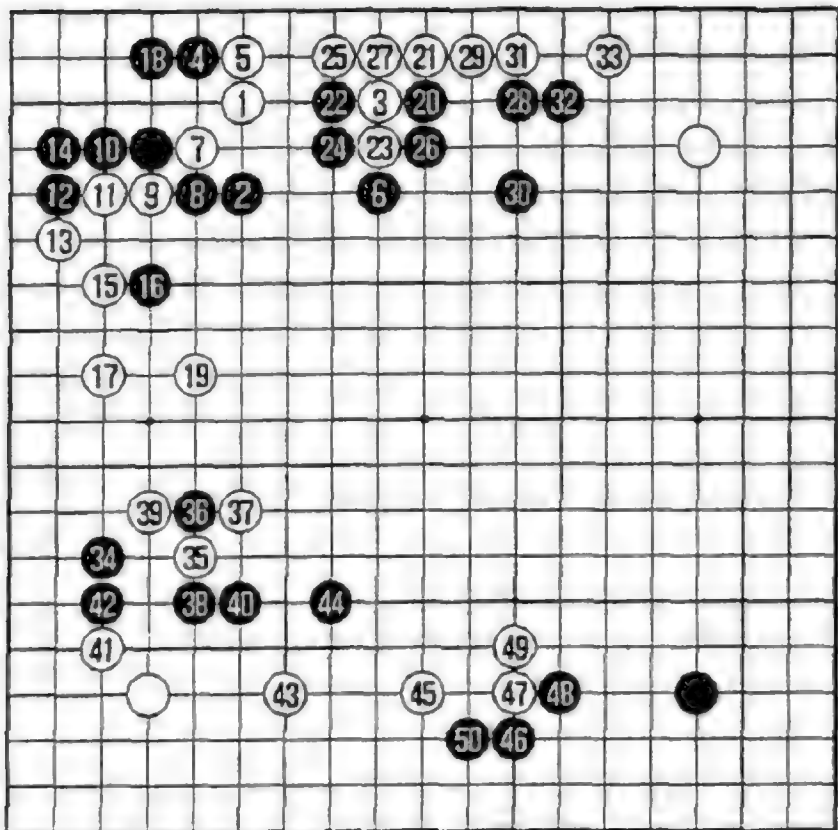
Game One: Diagram 4 (1-50) (151-200)



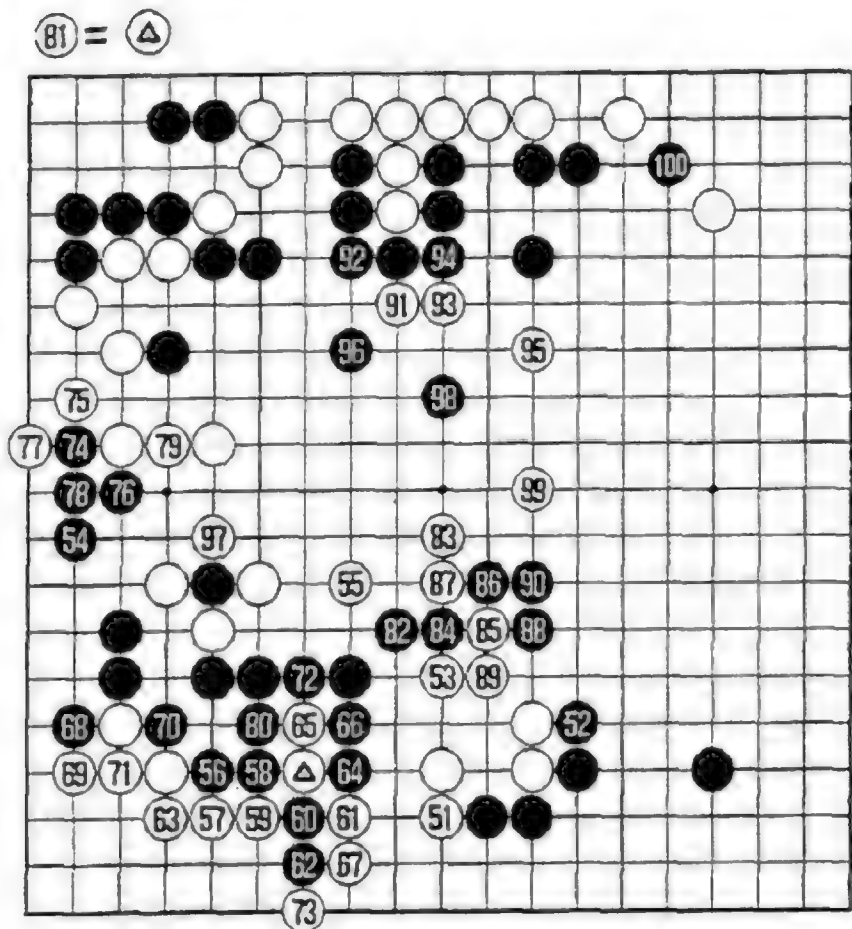
Game One: Diagram 5 (1-61) (201-261)

Game Two: 'Lanke Tu' (Ranka Diagram)

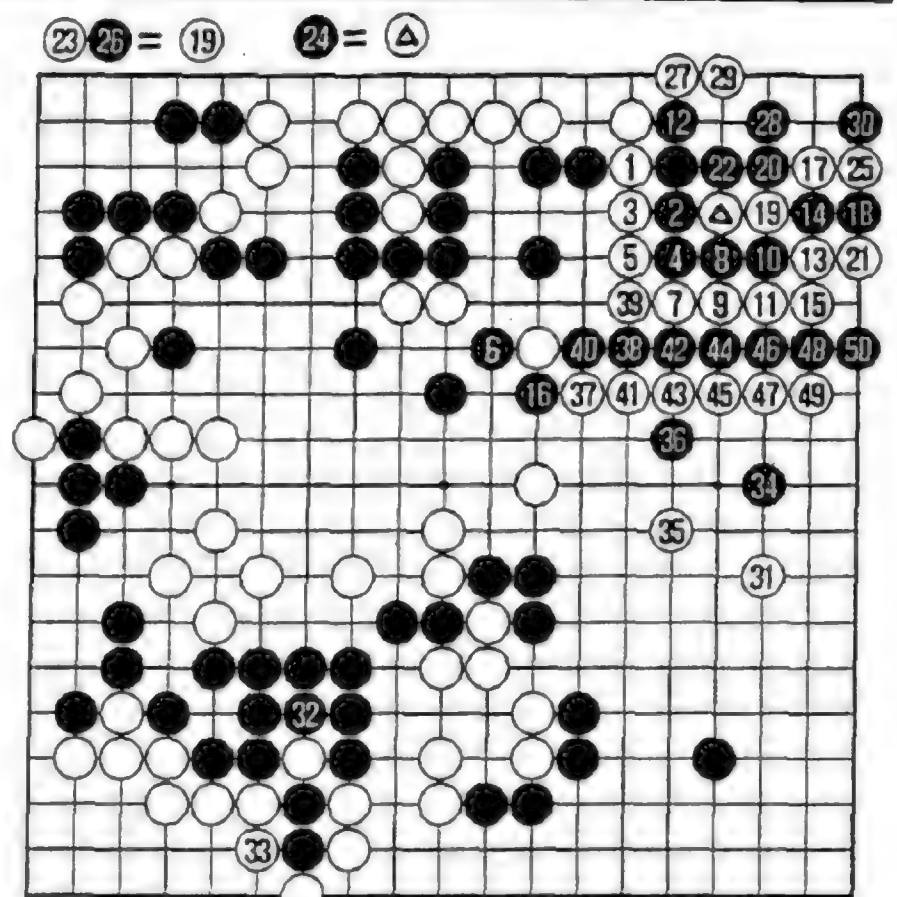
The footnote mentions that Wang Zhi was collecting wood on Mount Lanke of Huo Zhou when he met a fairy with whom he played a game of Goe. This game was recorded and passed on for generations. Result: White moved first, Black won by one point; Black captured 22 stones, White captured 9 stones; both sides made 145 moves; Black had 18 'lu' and White had 17.



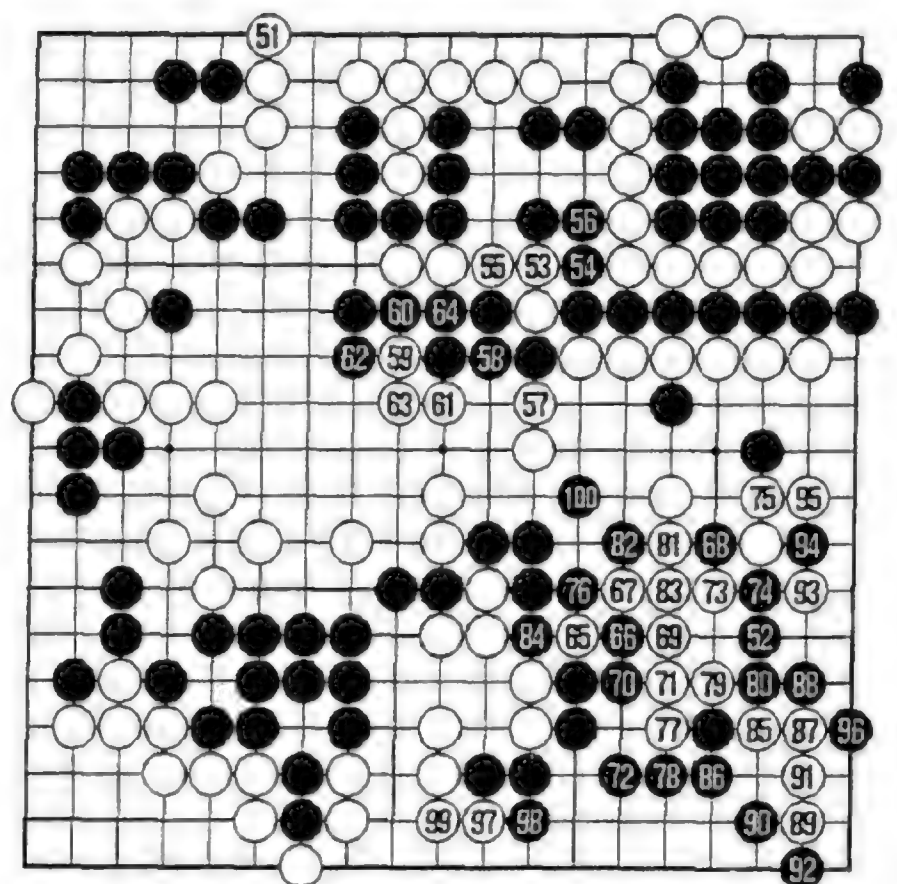
Game Two: Diagram 1 (1-50)



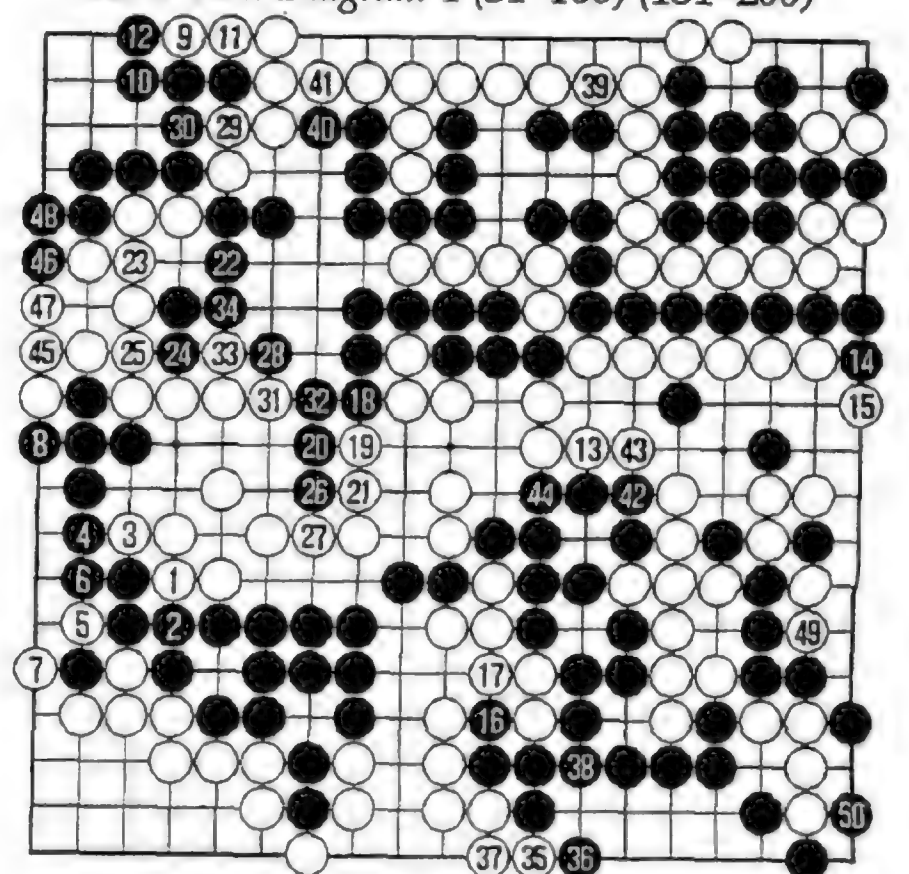
Game Two: Diagram 2 (51-100)



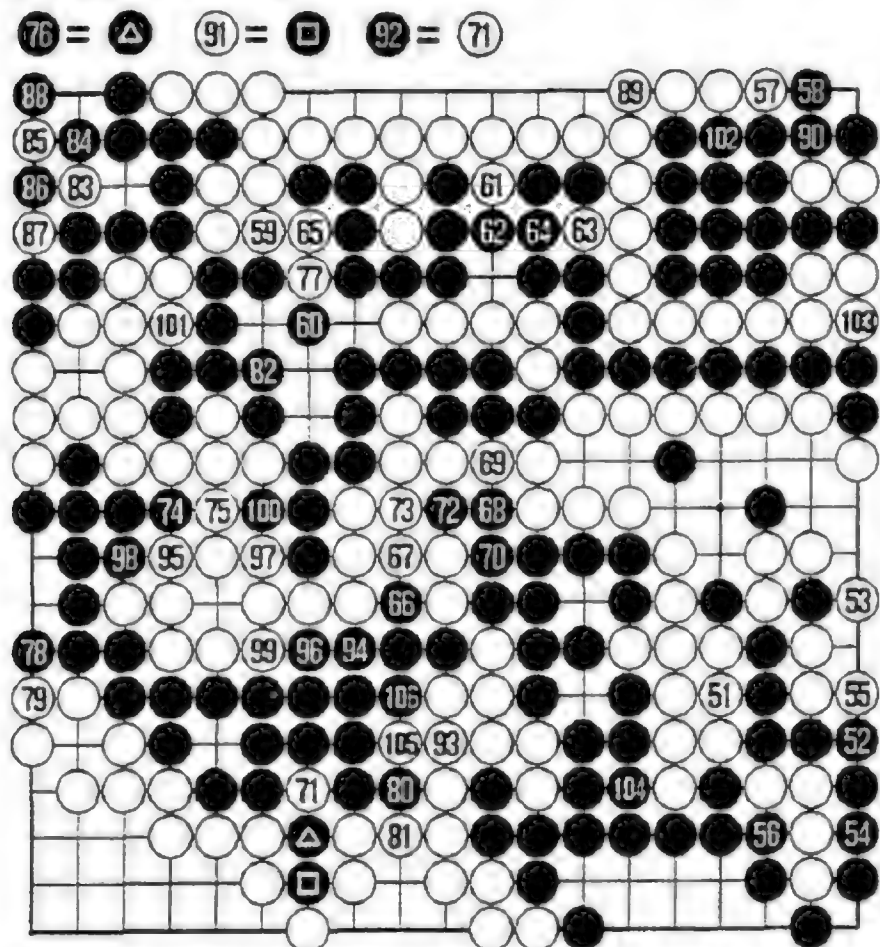
Game Two: Diagram 3 (1-50) (101-150)



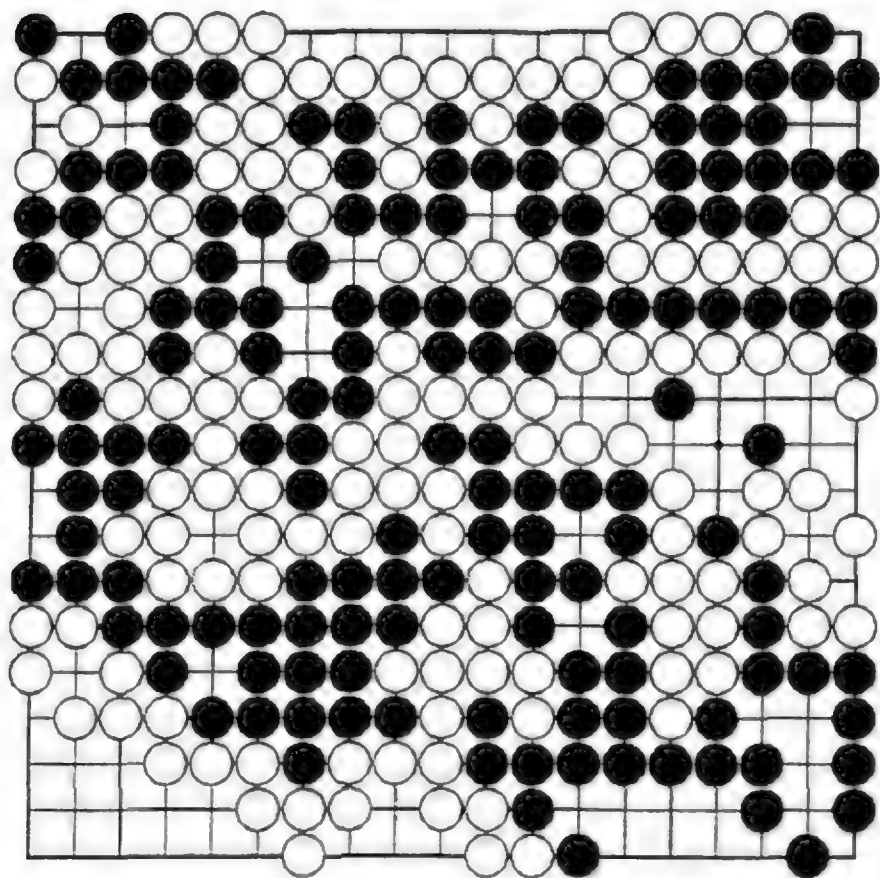
Game Two: Diagram 4 (51-100) (151-200)



Game Two: Diagram 5 (1-50) (201-250)



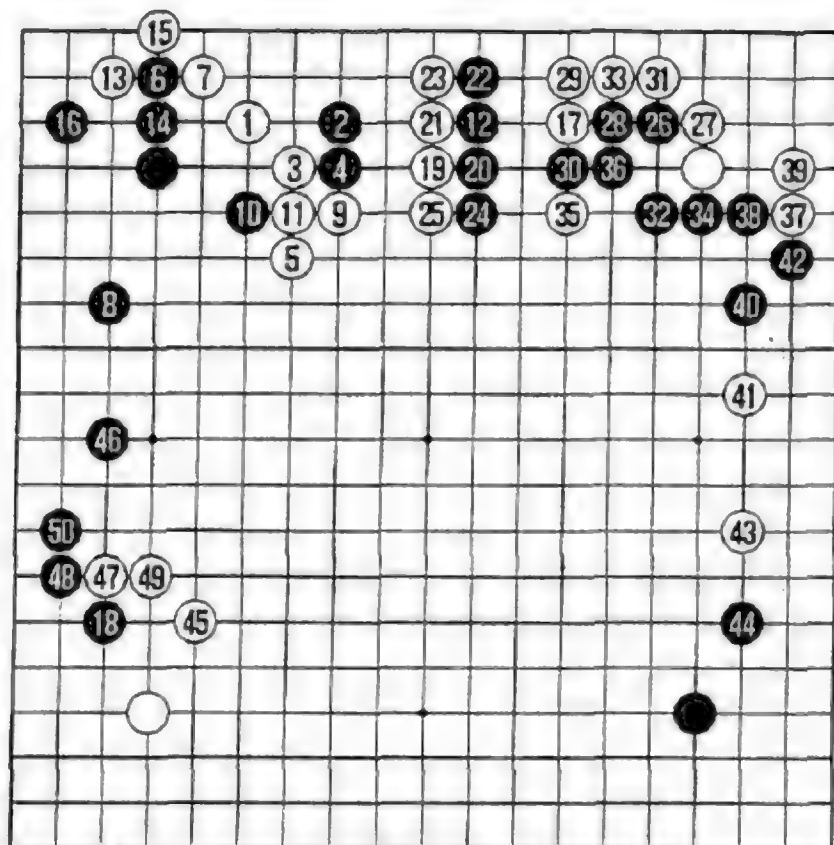
Game Two: Diagram 6 (51-106) (251-306)



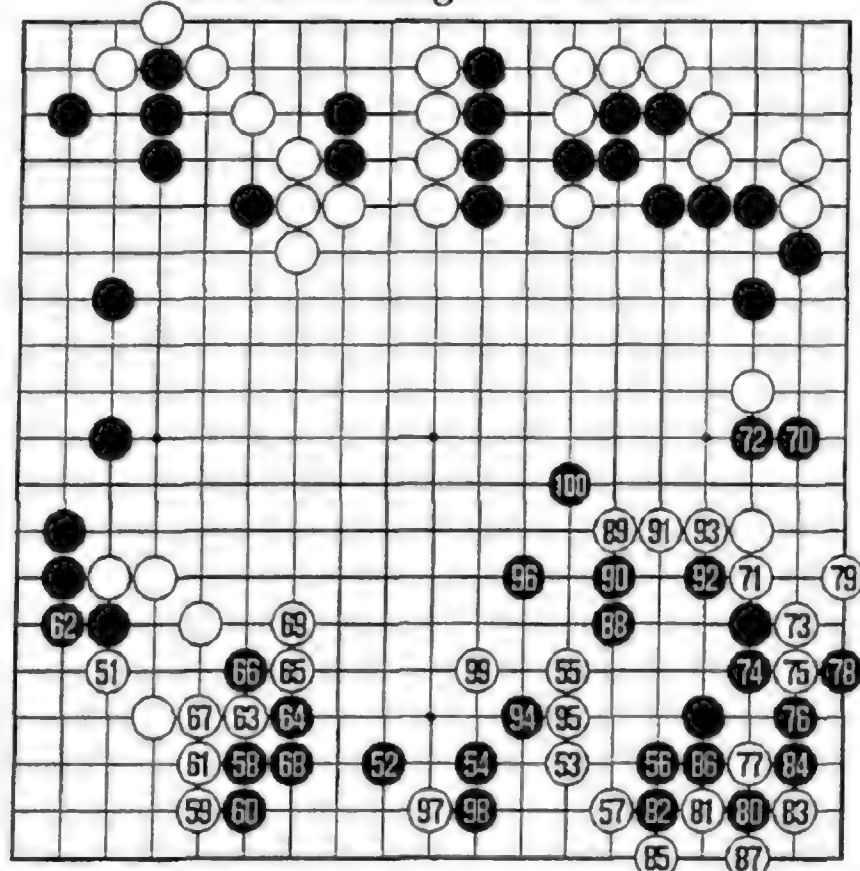
Game Two: Final Diagram

Game Three: 'Jin Hua Wan Tu' (The Golden Flowerpot Diagram)

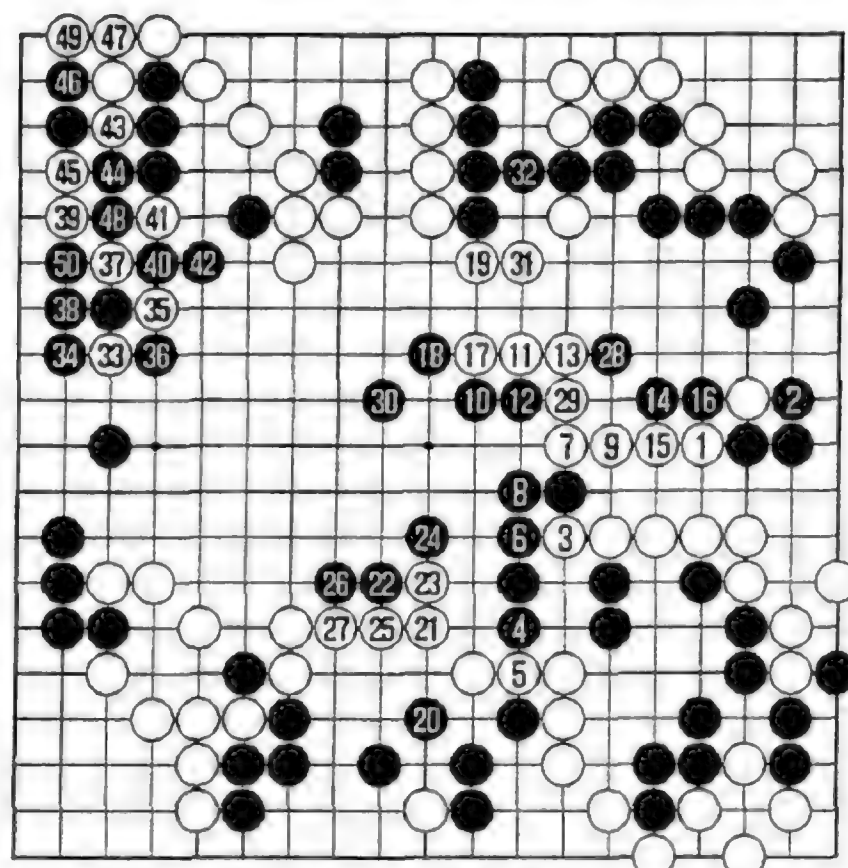
This game record got its name because, according to legend, the players Yan Jingshi and Gu Shiyan (both Goe officials of the Tang Dynasty [618-907 A.D.]) were fighting over a gold-plated flowerpot at the time when the game was played. Yan took White and played first. Gu (Black) won by one point. Result: Both Black and White captured 6 stones; each played 122 moves; Black had 40 'lu' and White had 39.



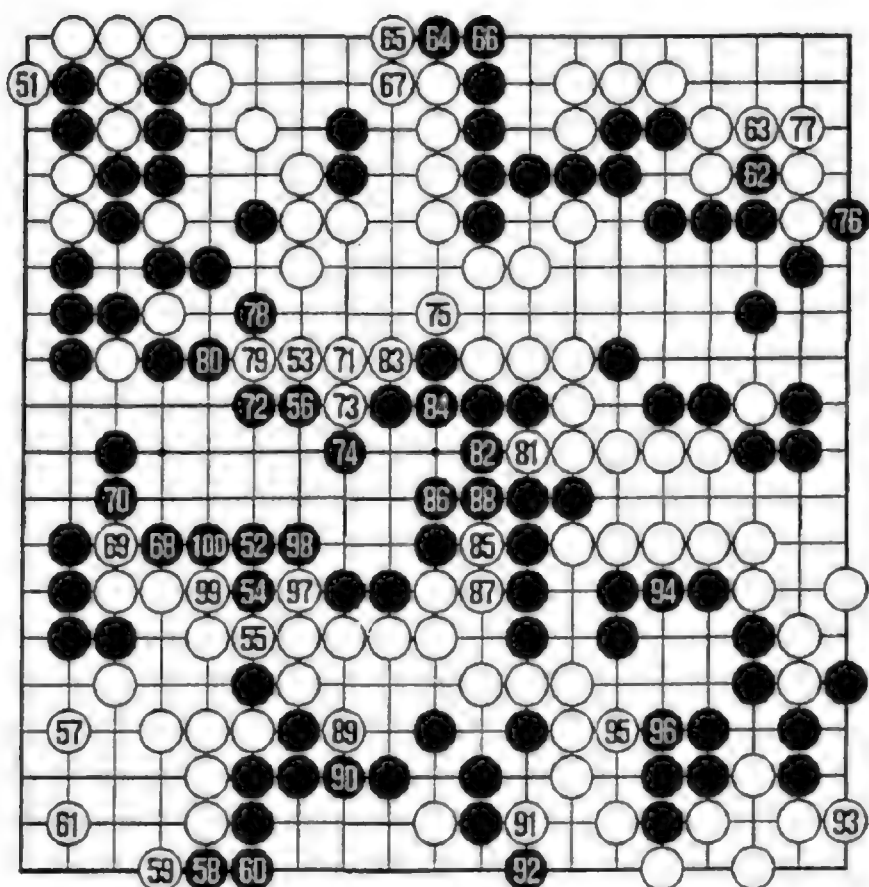
Game Three: Diagram 1 (1-50)



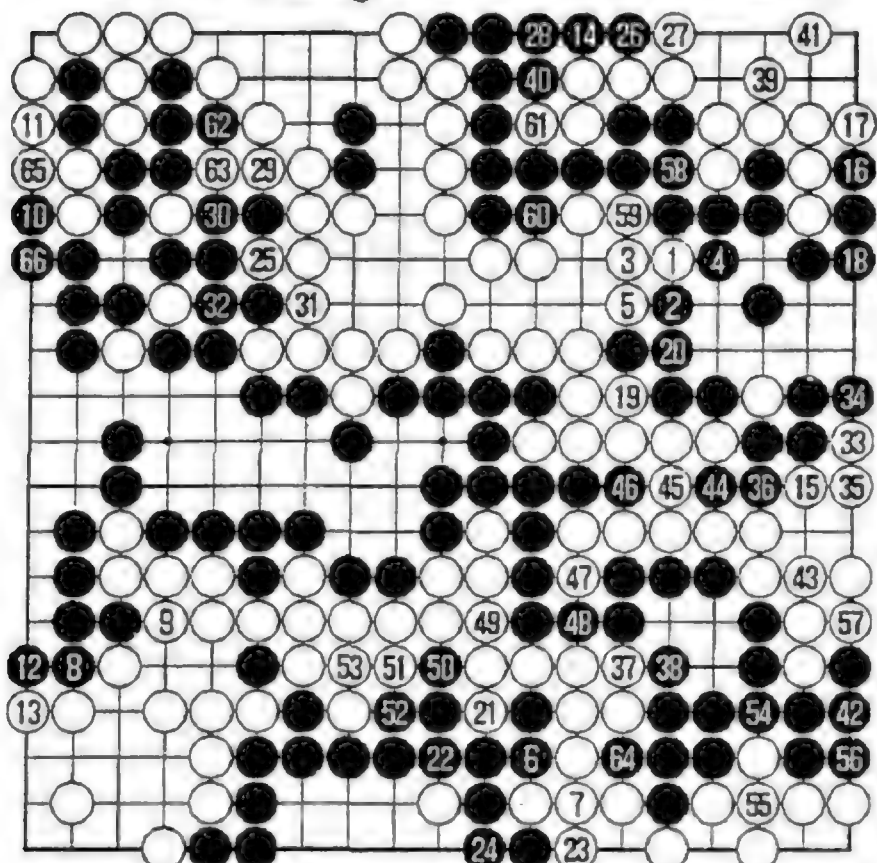
Game Three: Diagram 2 (51-100)



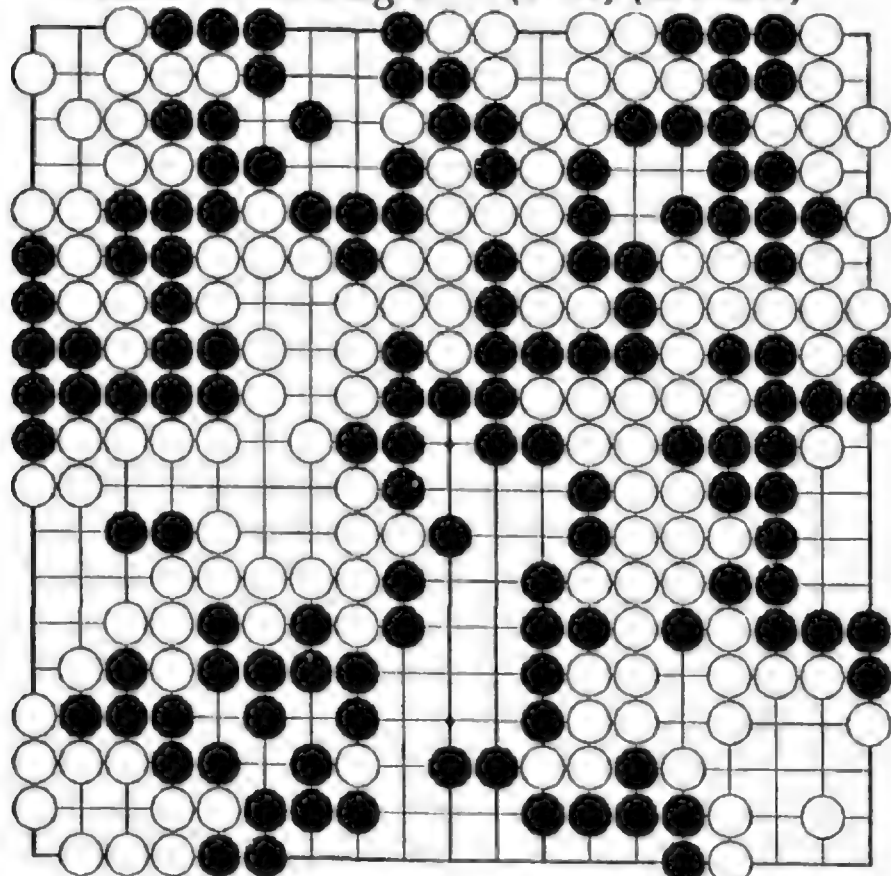
Game Three: Diagram 3 (1-50) (101-150)



Game Three: Diagram 4 (51-100) (151-200)



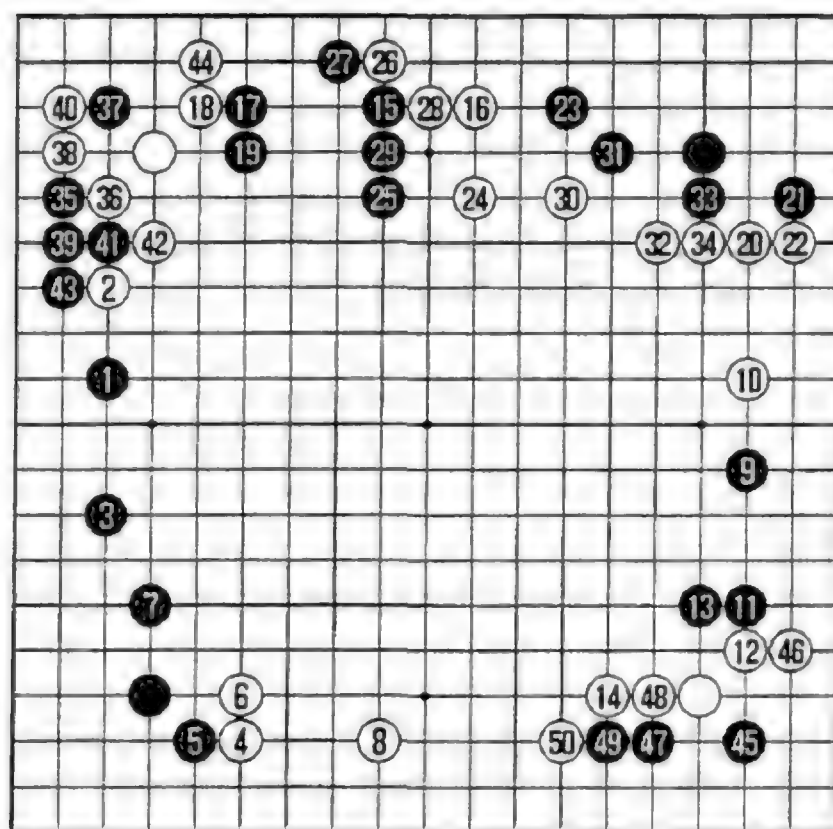
Game Three: Diagram 5 (1-66) (201-266)



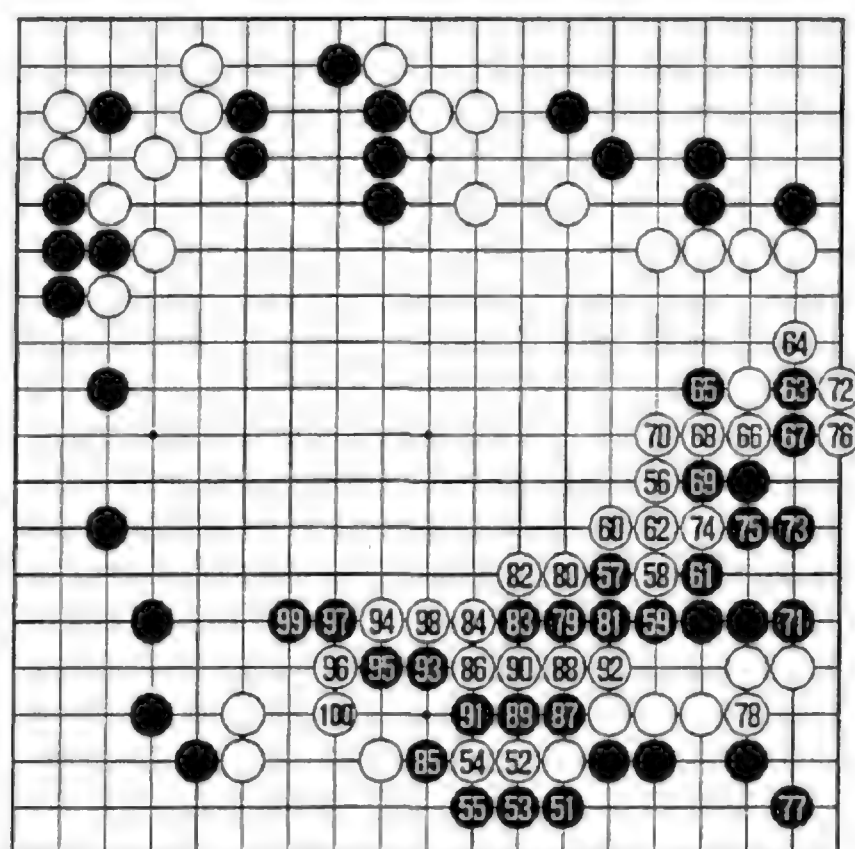
Game Three: Final Diagram

Game Four: 'Jia Xuan Tu' (Jia Xuan was a Goe official of the Song Dynasty)

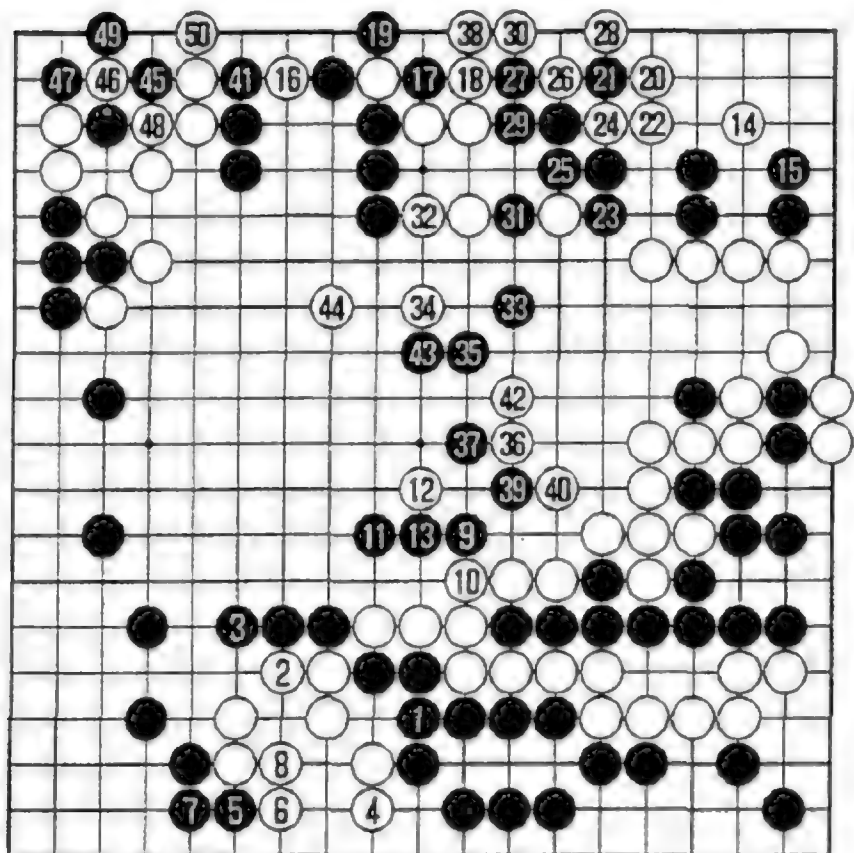
In this game Jia played against Yang Xican. Jia took Black and moved first. Yang lost by 8 'lu'. Result: White captured 21 stones and Black captured 9; each made 119 moves; White had 43 'lu', and Black had 51 'lu'.



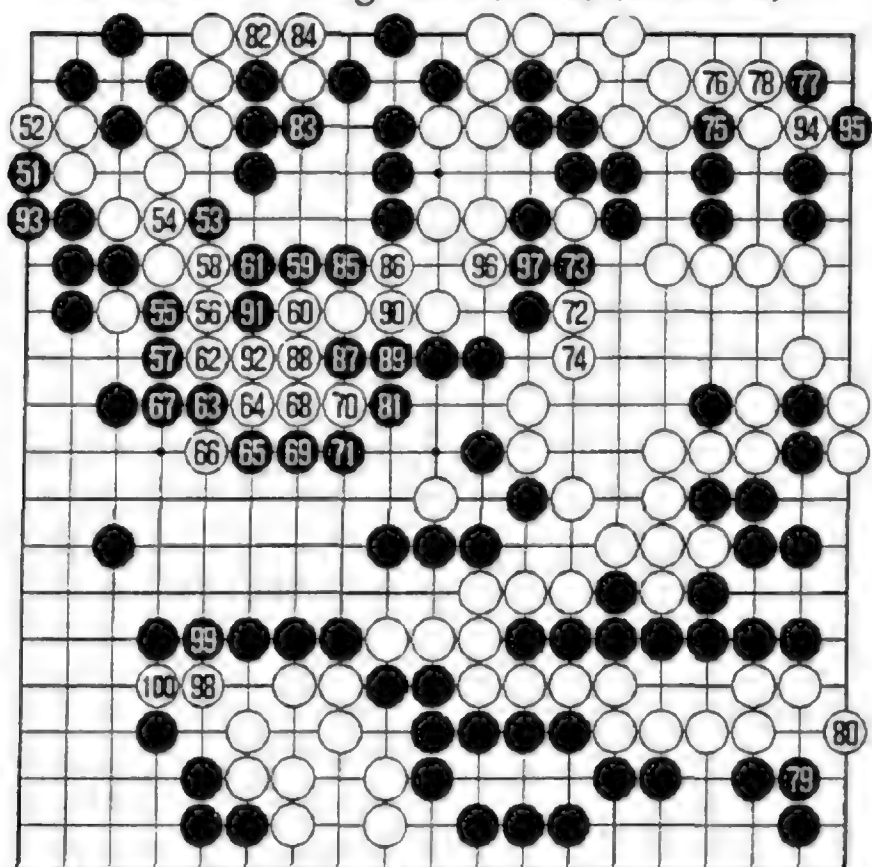
Game Four: Diagram 1 (1-50)



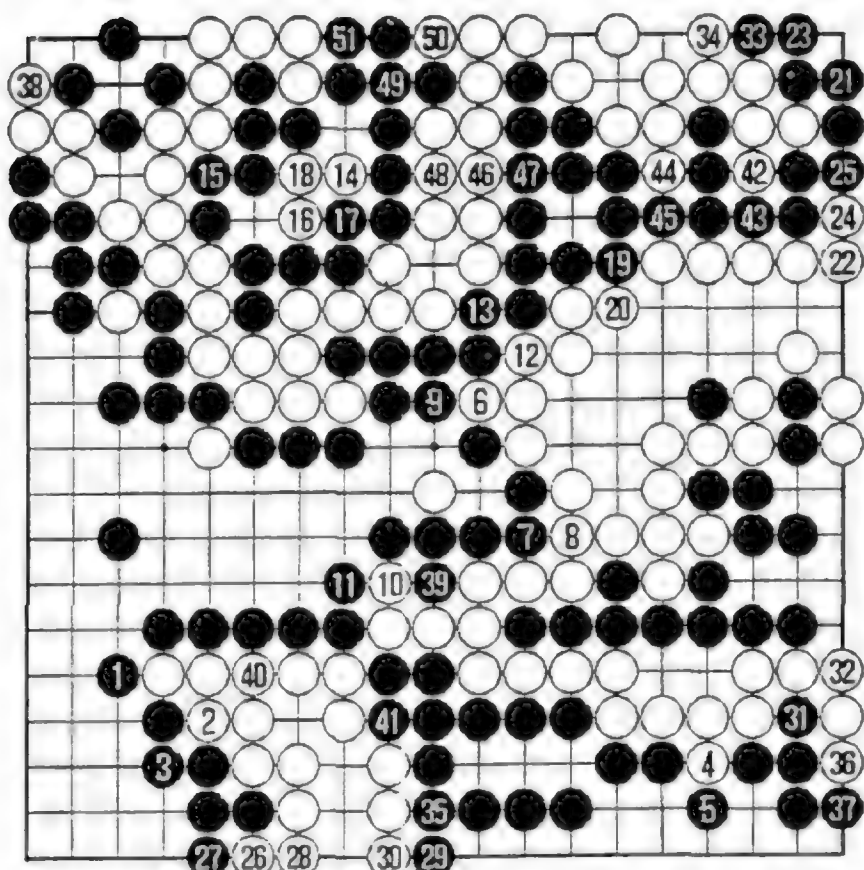
Game Four: Diagram 2 (51-100)



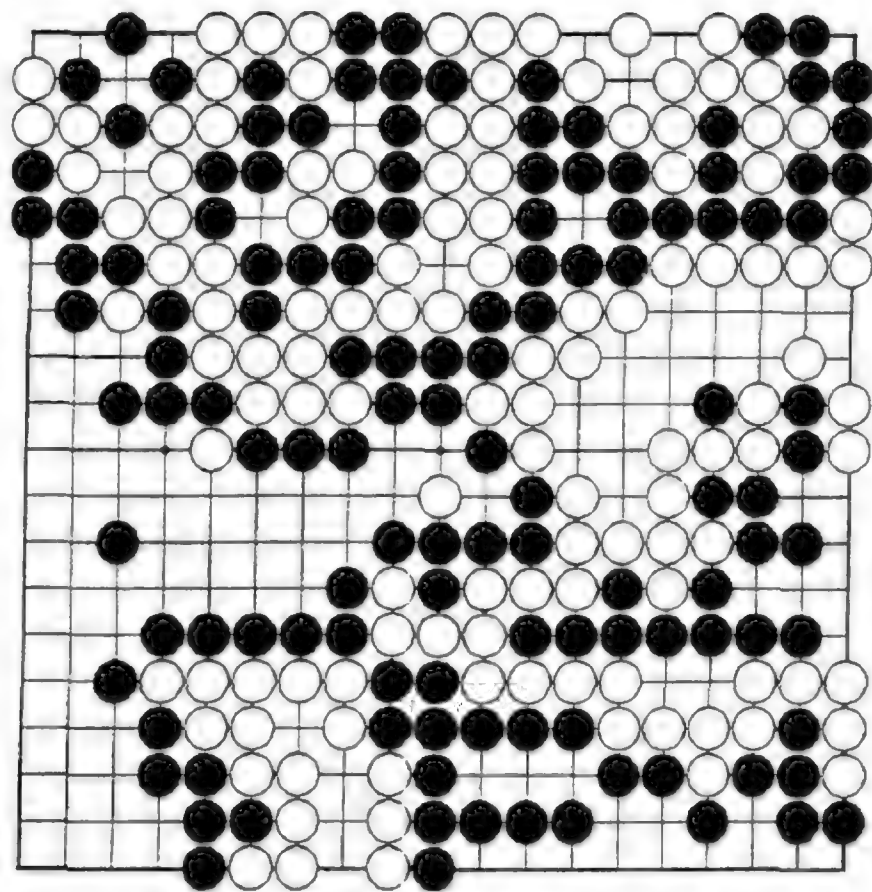
Game Four: Diagram 3 (1-50) (101-150)



Game Four: Diagram 4 (51-100) (151-200)



Game Four: Diagram 5 (1-51) (201-251)



Game Four: Final Diagram

The counting method used in these four games was clearly that of the comparison of the vacant points as indicated by the mention of 'lu'. The first game and the fourth game belonged to the Song Dynasty. The third game belonged to the Tang Dynasty. In the second game, Wang Zhi was a citizen of the Jin Dynasty (265-420 A.D.). Playing a game with the fairy was obviously a legend. This could also be a game record passed on from the Tang Dynasty. It is noteworthy that in the two games before the Song Dynasty, White went first. However, in the other two games played during the Song Dynasty, Black made the first moves. This agrees with the Japanese record (the game section of *Gu Shi Lei Yuan*), which states that in the old days stronger players took Black and the weaker players took White; This was reversed later on. (Sha Jiguan has doubts on this. He said that White moved first in a number of game records of the Qing Dynasty, 1644-1911 A.D.) [A note from Ing: In the old days, there were no written rules on Goe. Whether Black went first or White went first was mostly up to the players.] An even earlier record called *Gujin Tushu Jicheng* refers to a 'Shinlun' (*Taiping Yulan*, Vol. 735 refers to it as 'Shinyu'), which mentions a strategic game called 'Wei-ch'i' where a good player knows how to position his stones so as to maximize his territory. The side with the more 'Dao' wins. If his reference is the *Huantan Shinlun* or the *Lujia Shinyu*, then one can conclude that

the Chinese were already counting 'lu' (vacant points) during the Han Dynasty (206 B.C.–220 A.D.). 'Dao' and 'lu' are essentially the same thing.

After switching to counting stones, the most obvious written record (to the best of my knowledge) is in the story of the *Jin Ping Mei Cichua* (1617 A.D.). In Chapter 504, it is mentioned that Chang Shujie and Bai Laichuang were betting on a game of Goe.

'After filling in all the endgame moves (dame), they started to count. Bai Alichuang had five groups; Chang Shijie had two. Bai should give three stones to Chang. Muttering to himself, "I lost on these three stones!" Bai eagerly counted his own stones and found out that he actually lost by five stones.'

This passage not only talks about counting stones, but also the number of groups. The side with more groups had to give his opponent one stone per group. This kind of rule was very common in China. Only in recent years, due to the influence of the Japanese rules, did the Chinese abandon this rule of counting the number of groups. However, the Chinese rule still required different counting depending on which side made the last move. In an even game, Black needed 181 stones to tie the game if he made the last move. On the other hand, Black only needed 180.5 stones to tie if White moved last. This was supposed to make the counting more precise. (This method was adopted by the Chinese Wei-ch'i Association of Taiwan.) [A note from Ing: Dr. Yang was a historian; the subject of Goe was not his specialty. In 1952, during the establishment of the Chinese Wei-ch'i Association, the Japanese Go Rules (1949) were translated into Chinese. These were the rules, which the Chinese adopted, that Dr. Yang alluded to above. In order to match the Japanese score of comparing vacant points, Black was required to give half a point of compensation (komi) if he made the last move. The chief editor, Sha Jinguan, warned that the Chinese should not continue to practice this type of half-and-half rules. This resulted in the difficult journey of more than twenty years of amending Goe rules.]

If you ask the Chinese why they modified their scoring system from comparing vacant points to counting stones, I can think of at

least two important reasons. First, there is no need to keep prisoners. It's simple and trouble-free. I can avoid many problems such as the ones that arose in legendary stories regarding captured stones (e.g., forgetting to count prisoners, cheating, etc.). Second, it can avoid a lot of unnecessary disputes if it doesn't cost one to move in one's territory. For example, bent-four-in-the-corner is generally considered dead. The side which decides to kill the corner can get rid of all his opponent's ko threats before starting a ko in the bent-four corner. Without any ko threats, the corner is dead. That's why *Qi Jing* says 'Bent-four-in-the-corner is dead at the end of the game.' This does not pose any problem with the stone-counting rule. However, with the method of comparing vacant points, disputes can arise if the opponent refuses to cooperate. That's why the concept of 'pass penalty' was introduced. This rule says that if one side wants to continue the game and his opponent passes, it costs his opponent one point for each pass he makes. This can solve the above problem. An American go player, Karl David Robinson, suggested this. His work, *The Structure of Go*, discusses in detail the different Goe rules, and the remedies for various special positions. The first draft of his article was finished in 1946. However, the final manuscript is still not completed. I hope that it will be published someday. Since the rules of the Nihon Ki-in don't have 'pass penalty', bent-four-in-the-corner is adjudicated as unconditionally dead (assumed to be unrelated to the rest of the board). This is extremely unreasonable. [A note from Ing: The first reason stated above for switching from comparing vacant points to counting stones is debatable. Chinese have been dealing with captured stones for more than a thousand years (from the Han Dynasty to the Ming Dynasty). Why the sudden change? The second reason given was a legitimate one: the use of vacant-point comparison in scoring leads to the adjudication of life and death. Only by counting stones can one determine life and death by capturing. This was the most significant advancement in the evolution of Goe rules.]

(Continued in the next issue)

Translated by Sydney W. K. Yuan

A Comparison of the New Ko Rules

by Ru Lai Fo

The rule which prohibits the recurrence of a full-board position is known as the Super Ko Rule. This new ko rule was invented by a Japanese called Ikeda Toshio (1923–1974) around 1960. He extended the concept of a single ko, increased the number of moves which results in the recurrence of the full-board position, and applied the rule to rare situations of triple kos, quadruple kos, eternal kos, and cyclic kos. It was intended to eliminate games with no outcome due to the above situations. In 1974, Dr. Sun Junshan introduced this rule into Taiwan from the United States. The Chinese Wei-ch'i Association (CWCA) had been incorporated just two years earlier and was in the process of founding the Mingren Tournament with the Xinsheng News. The Xinsheng News agreed to carry daily news on the tournament and to publish the game records. At the same time, the CWCA was in the midst of amending the adopted translation of the Japanese Goe rules. Before that the chief editor of the Taiwanese Wei-Ch'i Magazine, Sha Jiguan, had published up to seven articles in five to six years, advocating that the half-and-half rules of the Chinese Wei-ch'i Association be amended. Therefore, the first Edition of the *New Chinese Wei-ch'i Rules*, published in 1974, adopted the Super Ko Rule instead. The Super Ko Rule was also adopted by the Beijing Chinese Wei-ch'i Association in 1975, when they amended their rules. Whether this was just coincidence, nobody knows. One thing is for sure: the Super Ko Rule was invented by the Japanese Ikeda Toshio. The Chinese summary of the Super Ko Rule, *Quan Tong Jin Zhe* (meaning 'the recurrence of a board position is prohibited'), was invented by Mr. Ing Chang-Ki.

In 1974, the Chinese Wei-ch'i Association printed more than 2,000 copies of the first edition of the New Rules and distributed them to Goe organizations throughout the world. The address list of Goe organizations was provided

by the Nihon Ki-in. It was hoped that there would be some feedback to be used for future references in amending the rules. The most detailed and valuable response was from Mr. William F. Mann of the Massachusetts Go Club of the United States. His lengthy letter was mailed to the Chinese Wei-ch'i Association on November 8, 1975. Mr. Mann thought that the concept of the Super Ko Rule, though it appeared to be correct, was actually wrong. He wrote that the problematic and hasty adoption of this rule was not to be recommended. One should thoroughly analyze the rule before making a decision. He also attached six or seven diagrams showing situations in which the use of the Super Ko Rule might be questionable.

This letter was published in its entirety in the January 1976 issue of the *American Go Journal*. A summary of the letter was also published in the July issue of the Taiwanese *Wei-ch'i* magazine. Mr. Ing Chang-Ki agreed with Mr. Mann's reasoning and devoted more than ten diligent years to the study of Goe rules. Finally, in 1991, he confirmed that the theory of Super Ko was untenable. In actual practice, it is impossible for the referee to implement the rule. This new ko rule is unreasonable and impractical. As a result of Mr. Ing's long and difficult journey in the research of Goe rules, he came up with the rule of 'hot stones' as inspired by the terminology of ko fights used in the Ming Dynasty. The New Ko Rules prohibit the cyclic repetition of a board position and classify kos as either fighting or disturbing. This discovery was not by chance and was very rewarding.

The path from research to the invention of the ko rule was a long and winding one. First, it required the discovery that the recurrence of (a single) board position does not necessarily lead to invariation, but invariation will lead to recurrence of position(s). Reoccurrence of a particular board position (Super ko) is only a

subset of invariation. Variation ensures the progress of the game. Invariation, on the other hand, impedes progress and leads to recurrence of two board positions or the cyclic repetition of board positions. They result in games with no outcome. This adjudication of games with no outcome does not satisfactorily resolve the situation, which impedes the progress of the game, when both sides refuse to budge. It proves that as the skill of Goe advances, knowledge of the rules falls behind. The traditional ko rule is only suitable for single ko fights. Apart from the single ko rule, there was no other rule to determine the life and death of various ko situations. For this, we Chinese (who invented Goe) should be ashamed of ourselves.

Since this is a question of rules and not skill, one should not blame the Goe players (e.g., Go Seigen, et al.) for their inability to come up with better rules. Goe rules require entirely different knowledge than playing skills. The theory of Goe is the basis for rules, which in turn are the basis for playing skills. In order to amend the rules, one must first analyze the theory thoroughly. This has nothing to do with one's playing strength. Those who should be responsible are the committee members who formulated these rules. In the past, people put emphasis only on Goe skills. Players started to pay attention to Goe rules only about 50 years ago. The Rules Committee of the American Go Association initiated the movement by writing a book called *The Structure of Go* (1934). This book is more than 200 pages long and discusses various Goe rules and problems. There is a typewritten copy of this book in the Ing Chang-Ki Goe Educational Foundation in Taipei. Due to lack of interest in the subject, no one was willing to publish the work. Adjudication on the outcome of Goe games probably never occurred in ancient China. Nowadays, they tend to make the news every few years. In the future, the frequency of these events will definitely increase. Moreover, in the past, all the tournaments were small in scale. Thus, there was no need for written rules and the tournaments did not receive much attention either. Now the situation is different. There is a need for a unified, complete, detailed and reasonable set of rules. Because of this, we Chinese, who invented

Goe, should work even harder to fulfill this responsibility of unifying the rules of Goe.

The rules of Ikeda Toshio forbid the recurrence of the full-board position. They will be referred to as the Ikeda rules. The rules of Ing Chang-Ki use ko to prevent invariation and classify kos as fighting or disturbing. They will be referred to as the Ing rules. Both are pioneers in the study of Goe rules. They shared a common goal of composing a set of rules which does not require adjudications.

There are two types of adjudication according to the traditional Japanese Rules:

1) adjudication on linking, as in the case of bent-four-in-the-corner or other endgame situations, which do not exist in the definition of counting both stones and spaces as territory;

2) adjudication of games with no outcome; this is what the two rule experts (discussed above) tried to eliminate.

So what are the differences between the Ikeda rules and the Ing rules? The Ikeda rules were created in the 60's, the Ing rules in the 90's. There was a lapse of 30 years. The Ing rules were originally derived from the Ikeda rules but with modifications and improvements. Since I am not a good writer myself, I'm afraid that it won't be easy for me to explain clearly such a complicated issue, but I will do my best. Please bear with me if you don't understand what you are about to read. However, if you patiently study the rules, you will be able to comprehend them. I will discuss these rules according to the following five points.

1. The Difference in Definitions.

Super Ko (Ikeda rules) prohibits the recurrence of (a particular) full-board position resulting from an even number of moves (e.g., 2nd, 4th or 6th move). This leads to a new board position. Invariation, on the other hand, is the recurrence between two board positions or the cyclic repetition of board positions. There are two causes of invariation: a) not observing the ko fight rule, and b) a disturbing ko. The hot-stone rules (which forbid the immediate recapturing of a ko stone) should be used to prevent invariation due to a ko fight. The prohibition of the disturber's move which results in the recycling of the board positions

should be used to prevent invariation due to a disturbing ko. The prohibited moves in the hot-stone rule are even, like those of the Super Ko rule. The prohibited moves in the disturbing ko rule are odd (e.g., 3rd, 5th, 7th or 9th), opposite to those of the Super Ko rule. By disallowing the move which immediately captures the hot stone or leads to cyclic repetition, a new board position results.

2. The Type of Hot Stones

According to the Ing rules, there are single, double, and triple hot stones. The traditional ko rule, which can be applied only to single ko fights, is not adequate. Therefore, the Ing rules created double hot stones for eternal-life ko and twin hot stones for triple ko. All the adjudications are naturally eliminated. Forbidding the immediate capture of hot stones is the most brilliant ko rule. The double and twin hot stone rules were invented based on (and inspired by) the concept of the new single ko fight rule of Ikeda, which prevents the recurrence of full board positions. The shortcoming of the Ikeda rules is mechanically prohibiting the even number moves (2nd, 4th or 6th) which lead to repetition of board positions. It is complicated and impractical. Inspired by the single hot stone rule of the Ming Dynasty, the Ing rules created double and twin hot stones to supplement the inadequacy of the single ko rule. With a common goal, the result of applying the Ing rules and the Ikeda rules is quite different. The rule on prohibiting the immediate capturing of hot stones is far superior to Ikeda's rule of forbidding the even number moves which recreate the same board position.

Because Mr. Ing is Chinese, he was inspired by the terminology of hot stone since he was a child. This resulted in the invention of the double and twin hot stones. Ikeda was Japanese. He had probably never heard of the term hot stones and was never inspired by it. There is nothing better than using the hot stone rules to resolve ko situations. There is also no better terminology than the term hot stone. The person who invented this term was very ingenious.

3. Disturbing Ko and the Disturber (Ing's rules, Chapter Two, Article 5, Rule 6.)

A disturbing ko is initiated by a disturber

who illegally recycles the ko stones without a ko fight that involves hot stones. These include the disturbing of a seki (with permanent ko liberties), the disturbing by a dead group (with false ko liberties) or self-capturing of a single stone. The Ing rules say 'the move which leads to the recycling of board positions is prohibited.' After the disturber has been identified as the one who initiated the recycling, he can be stopped any time during the second cycle. After recycling is stopped, the seki with permanent kos remains unchanged and the dead group with false liberties is captured.

To prevent invariation by ko, one must be able to distinguish between a ko fight and a disturbing ko. Super Ko does not identify whether the repetition of a board position is caused by not observing the ko-fight rule or by disturbing ko. It looks only for the repetition of board position and doesn't care about the reason for its formation. Any move which results in the repetition of a board position is prohibited. It mechanically forbids the even number moves and is unreasonable. The disturbing ko rule forbids the move which recycles the board positions, i.e., one move after the board position is repeated for the first time. Thus, the disturbing ko rule forbids the odd number moves. The end result is of course entirely different. The application of the disturbing ko rule to a disturbing ko conforms to the theory of Goe. On the other hand, the application of the Super Ko rule to a disturbing ko is against Goe theory.

There are three types of disturbing ko: 1) the disturbing of a seki with permanent ko breaths (disturbed life), 2) the disturbing by a dead group with false ko breaths (disturbed death), and 3) the self-capturing of a single stone (self-disturbed). If the (involved) group of the disturbing party is alive, it is known as disturbed life. If the (involved) group of the disturbing party is dead, it is known as disturbed death. The disturbing of oneself (by self-capturing a single stone) is known as self-disturbed. Live stones should not be killed because of disturbance. Likewise, dead stones should not be revived. A disturbing ko only recycles the ko liberties, and cannot alter the life-and-death status of any group. Its nature is completely different from a ko fight which

determines life and death. Ikeda did not know that the recurrence of board position could result from both a ko fight (not observing the ko fight rule, rather) and a disturbing ko. One must follow the Ing rules which say 'prevent invariation by ko; ko is classified as fighting or disturbing.' This way one can clearly distinguish the difference in restrictions between a ko fight and a disturbing ko. This conforms to the theory of Goe.

4. Determine Life and Death by Identifying Breath Types (Ing's Rules, Chapter Two, Article 4, Rule 4.)

This rule was invented by Ing. Breaths can be classified as false breaths and real breaths. False breaths can be filled while real breaths cannot be filled. Groups with a pair of real breaths can never be captured, because one can only make one move at a time.

The life and death of any group can be determined by identifying the types of breaths associated with the group. Normally, there is no need for proving life and death by capturing, unless there is a dispute. This is an undeniable fact. Therefore, the written rules should clearly state the definition of how to 'determine life and death by identifying breath types.'

Breaths are formed by stones. Thus, the type of breath is determined by the shape of stones. Stones can be divided into three types, a single stone, a solid group of stones, and ko stones. A single stone has external breaths but no internal breaths. A solid group might contain balanced breaths, permanent breaths, and/or false breaths. A ko stone might involve fighting breaths, permanent breaths, and/or false breaths. The breaths within a solid group are fixed and cannot alter the positions of the black and white stones. On the other hand, ko breaths and ko positions are interchangeable between Black and White. A ko breath, unless linked, contains a vacant point and has the same value as an eye breath or a shared breath. Therefore, an eye breath is not superior to a ko breath. In a ko fight for breath, it has not been determined whether the breath is real or false. The winner gets real breath(s) and the group lives. The loser ends up with false breath(s) and his group dies. This type of ko is known as an essential ko. Groups with balanced ko

breaths coexist in a seki. A group with false breaths only is dead. From this one can see that life and death have been determined, and these kos can only be used as ko threats. If the essential ko is used in a cyclic ko where no particular hot stone is involved, the rule which prohibits the recycling of board positions should resolve this and any other disturbing ko.

5. The Best Definition for 'Real Breaths' is 'Breaths that Are Paired'.

All 'real breaths' are internal breaths and there should at least be two separate breaths. Another type of 'real breath' occurs in a seki where the internal breaths and external breaths for Black and White are balanced. Any breaths which do not fall in the above category are false breaths. Traditional Goe rules determine life and death by eyes. Groups with at least two eyes are alive. Since the probability that a group lives independently is 97% compared to the 3% of seki, the traditional rule appears to be simple and practical. It is also easy to understand. Unfortunately, this definition cannot handle the situation of a seki and is incomplete.

There are four basic shapes of breaths, namely, territory breaths, eye breaths, shared breaths, and ko breaths. Territory breaths consist of more than two real breaths. They are only found in groups that are independently alive, and there is no need for further discussion. With two eye breaths a group lives independently. With two shared breaths, both (black and white) groups coexist in a seki. Out of all the breath types, only the above two can form a live group independently. The shared breaths and ko breaths must combine with other breaths to form a seki, e.g., eye and shared breaths, eye and ko breaths, shared and ko breaths. The two ko breaths of a seki are called balanced breaths and can be formed into a disturbed life. The ko breaths of a dead group are called false ko breaths and can be formed into a disturbed death. The traditional rules don't have the concept of disturbing ko, e.g., disturbed life and disturbed death. This results in half of the adjudications. In this 20th century of space-age technology, we must have a complete and yet precise set of Goe rules instead of a simple, partial and feeble set

of rules. Replacing the rule of 'determine life and death by eyes' with 'determine life and death by breath types' conforms to the needs of the 20th century. This is necessary because it gives the correct answer to every life-and-death situation, and not because Ing wants to be deliberately unconventional.

Now that I have discussed the above five points in detail, I would like to give a concise summary with the following two points.

1. The biggest theoretical mistake of Ikeda's rule of Super Ko is that it doesn't care about the reason for the repetition of board positions and only looks at the number of moves that results in the repetition. Not distinguishing between a ko fight and a disturbing ko is like treating different diseases with the same medicine. One only treats the symptoms, not the disease. Not only is the disease not cured, but it also leads to a lot of side-effects. This does not conform to the theory of Goe rules.

2. The Super Ko rule of Ikeda prohibits moves which result in the repetition of a board position. The sequence of these moves may be long or short. For sequences of more than five moves, it is very difficult for players to remember. This rule could be carried out with the aid of computers, but it is quite impractical if one only relies on human brains.

Players who did not make painstaking effort in studying Goe rules usually reject Ing's rules. Because there is a lot of unfamiliar ter-

minology, e.g., 'moves are unrestricted except for invariation', 'determine life and death by breath types', 'prevent invariation by ko', 'ko is classified as fighting or disturbing', 'stones and spaces are both territory', 'fill in all stones to count', 'hot stones', 'single hot stones', 'double hot stones', 'twin hot stones', 'immediate capturing of hot stones is prohibited', 'disturbing ko', 'disturbed life', 'disturbed death', 'self-capturing', 'moves which result in recycling of board positions are prohibited', 'winning space(s)', 'shared spaces', 'vacant spaces', 'compensation stones', 'penalty stones', 'losing stones', etc. There are at least 20 to 30 of them. Each one contains a new concept and has a special meaning. No wonder these people (who won't spend time to study the rules) complain that they do not understand. If you have no interest in Goe rules, you don't have to read or study Ing's rules. If this is the case, I hope you won't pretend to be an expert and criticize these rules at will. In doing so, you only show that you don't understand the rules at all. Mr. Ing likes to say, 'to reform, there will be opposition; the greater the success of the reform, the louder the objections; there are no exceptions throughout history.' For constructive objections, one should accept the correct suggestions and disregard the incorrect ones. As for those who oppose the rules because they simply don't like them (non-constructive objections), the best response is to dismiss them with a laugh.

Translated by Sidney W. K. Yuan.

5th Tong Yang Securities Cup Final

Lee Chang-ho v. Cho Chikun

At the time of this playoff Lee Chang-ho held ten of the 15 Korean titles. Though an international tournament, the Tong Yang Securities Cup is counted as one of the 15, and it was in the 3rd Cup that Lee scored his first substantial international success when he defeated Rin Kaiho 3-2. His second international triumph followed in the same title the following year when he defeated Cho Chikun 3-0.

The pairing between Lee Chang-ho, newly established as Korea's number one, and Cho Chikun, the number one or two player in Japan for a decade and a half, promised to be an exciting clash. In the semifinal, Cho, after declaring that he was 'staking his career as a go player' on it, defeated China's number one, Nie Weiping, 2-0. Lee gained his place in the final by defeating his teacher, Cho Hun-hyun, by the same margin. (It's safe to say that no go teacher in history has suffered at the hands of a pupil the way Cho has with Lee — one reason, of course, is that a teacher is usually no longer active by the time his pupil comes to the fore.)

The one-sided result betrayed the expectations of fans, but it was still a very interesting match. The decisive factor, as seen in his two half-point wins, seems to have been Lee's unrivalled precision in the endgame.

The games from the title match between the two are presented below. Note that Cho Chikun is entered in this tournament as a representative of Korea.

Game One

White: Lee Chang-ho 6-dan (Korea)

Black: Cho Chikun 9-dan (Korea)

Played on Cheju Island, Korea, on 22 April 1993. *Commentary by Rin Kaiho.*

Figure 1 (1-26). *Forestalling the moyo*

The probe of White 12 has already been tried a number of times. If Black answers it

at A, White B is troublesome, so at this stage attaching at 13 is the only move. When he does so, White is left with the *hane* of C, so Black no longer feels inclined to make the approach move at D.

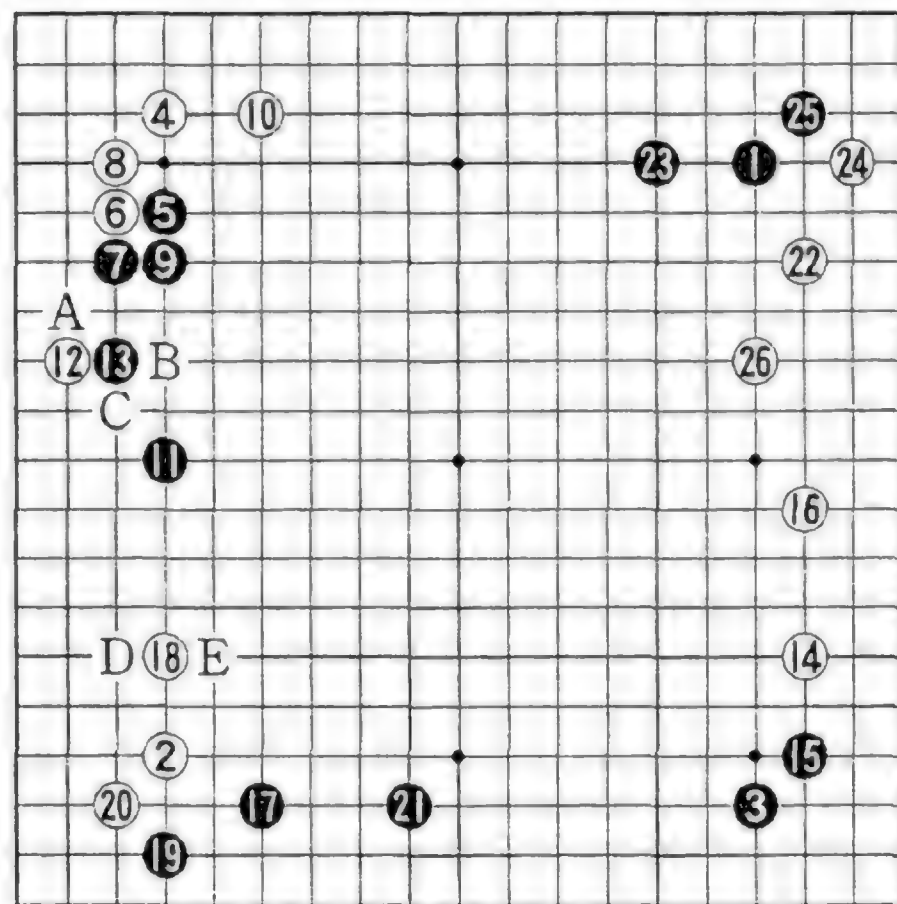


Figure 1 (1-26)

Usually White would be concerned that Black might exchange D for White 17, then expand the left side by jumping to E, but White 12 nips this in the bud. In short, White's aim is to guide the game into a leisurely development.

Up to 26, the game certainly becomes a leisurely one. You can say that White has carried through the strategy initiated by 12. Lee Chang-ho is confident in his endgame ability and he probably believes that if a game becomes a leisurely one he'll win it. I think that he's researched the opening well so that he can get the kind of game he likes.

Figure 2 (27-45). *Miai, miai*

Black 27. It's unclear whether this forcing move is good or bad.

Black 29 looks, well, reasonable. I can't find any other moves that look big. Black A instead would be slack.

White 32. If White later plays B, Black intends to counter with A.

Black 33. Cho Chikun probably agonized over this move. If Black makes the all-out checking extension (*tsume*) one line above 36, White will probably counter with an invasion at 42. Black would also like to play at 1 in *Dia. 1*, but White will take *sente* with 2, then switch to C in the figure, which is not interesting for Black. Another feasible move is wedging in at A, so the wide choice is bewildering.

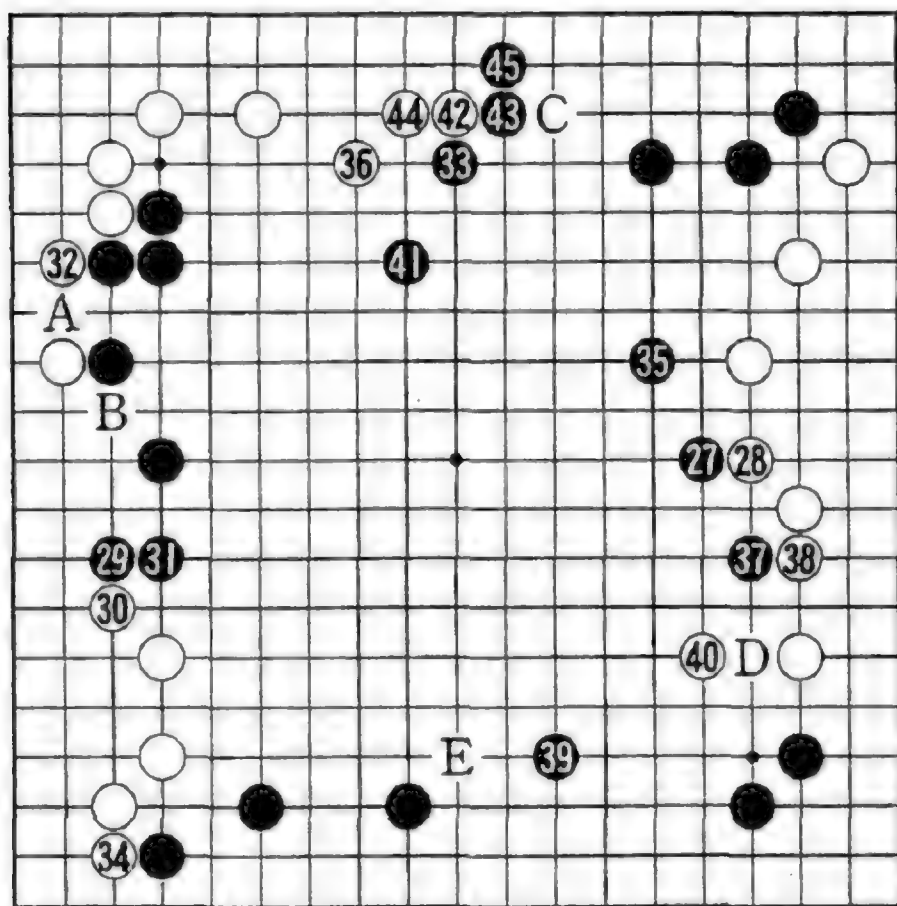
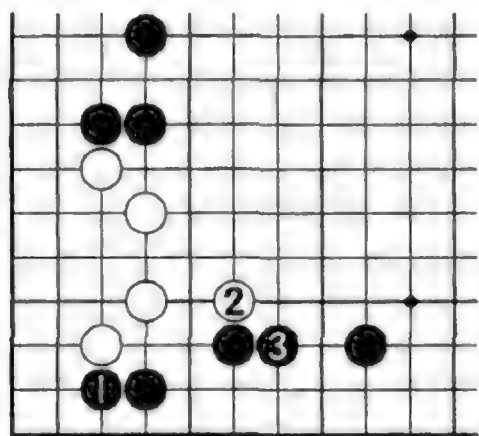


Figure 2 (27-45)



Dia. 1

Black 35 and White 36 are *miai*.

Black 39 and White 40 are also *miai*. If Black uses 39 to attach at D, White will make the shoulder hit at E.

When the large moves are all in a *miai* relationship with each other in this fashion, Black can't find moves he can be satisfied with. The game remains close no matter how far it progresses — the pace is being completely dictated by Lee Chang-ho. To back-

track, you can say that concealed within moves like White 34 is a strength that doesn't appear on the surface.

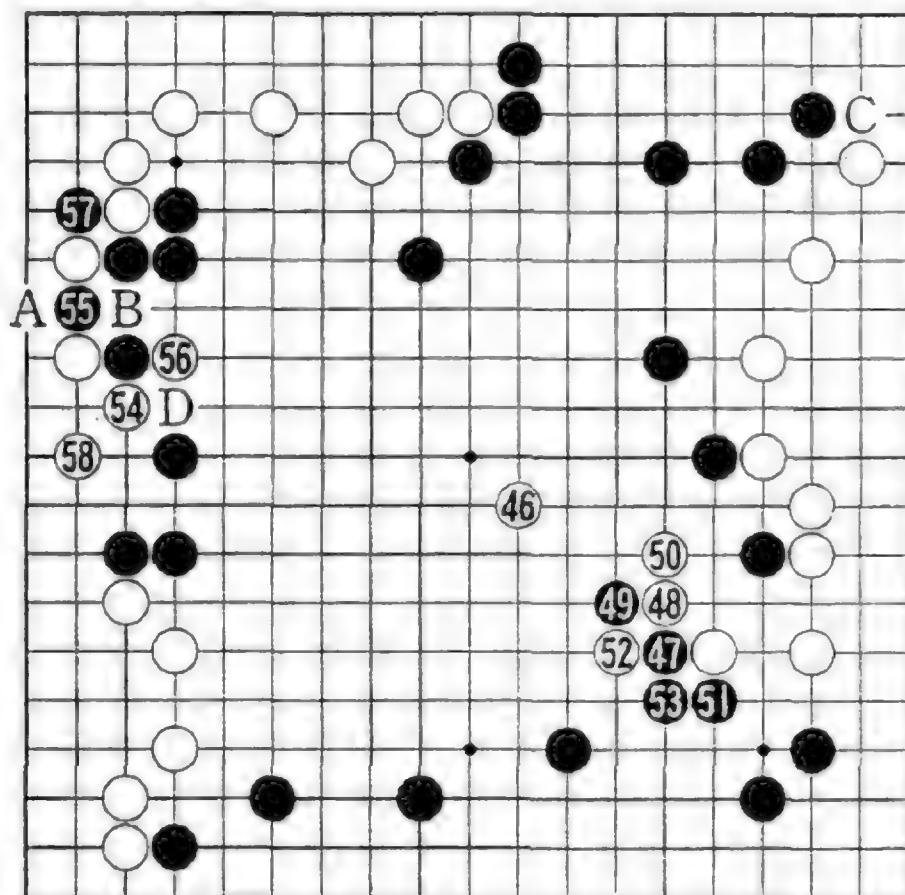
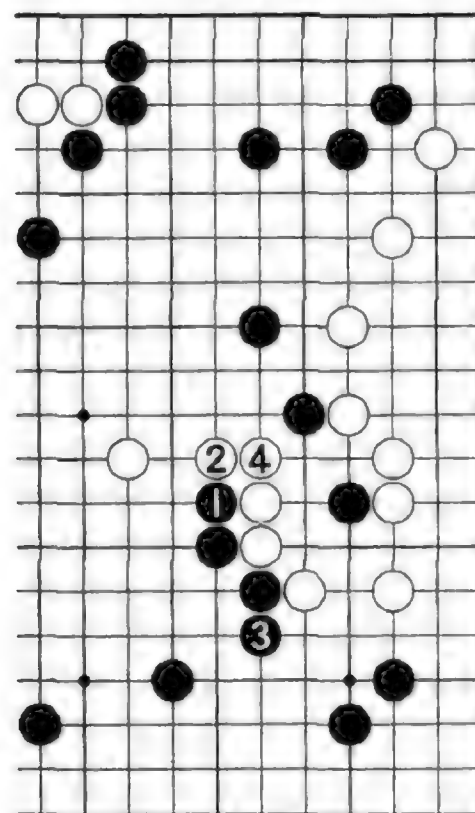


Figure 3 (46-58)



Dia. 2

Figure 3 (46-58). Fighting erupts on the left side.

White 46 is a good guess. If instead White connected at 55, then Black 49 would become a good move.

Black 47 is another perplexing point. Black could also consider playing 55, White A, Black B, putting the onus on White to decide how to continue. The aim of 47 is to seek an opportunity to attack the solitary stone at 46; Black is also hoping for a chance to convert the bottom area into territory.

White 48 and 50 are calm moves.

Black 51. Pushing up at 1 in *Dia. 2*, then pulling back at 3 would also be a good strategy. After White 4, Black could switch to 55 in the figure — White A, Black B, White 57 follow. The only thing is that this would lead to an endgame contest, just as in the game.

The addition of the cut at 52 means that White 46 is connected as it stands.

White 54 is a move White has been aiming at for a while.

Black 55 shows fighting spirit: Black D and White B would be unbearable.

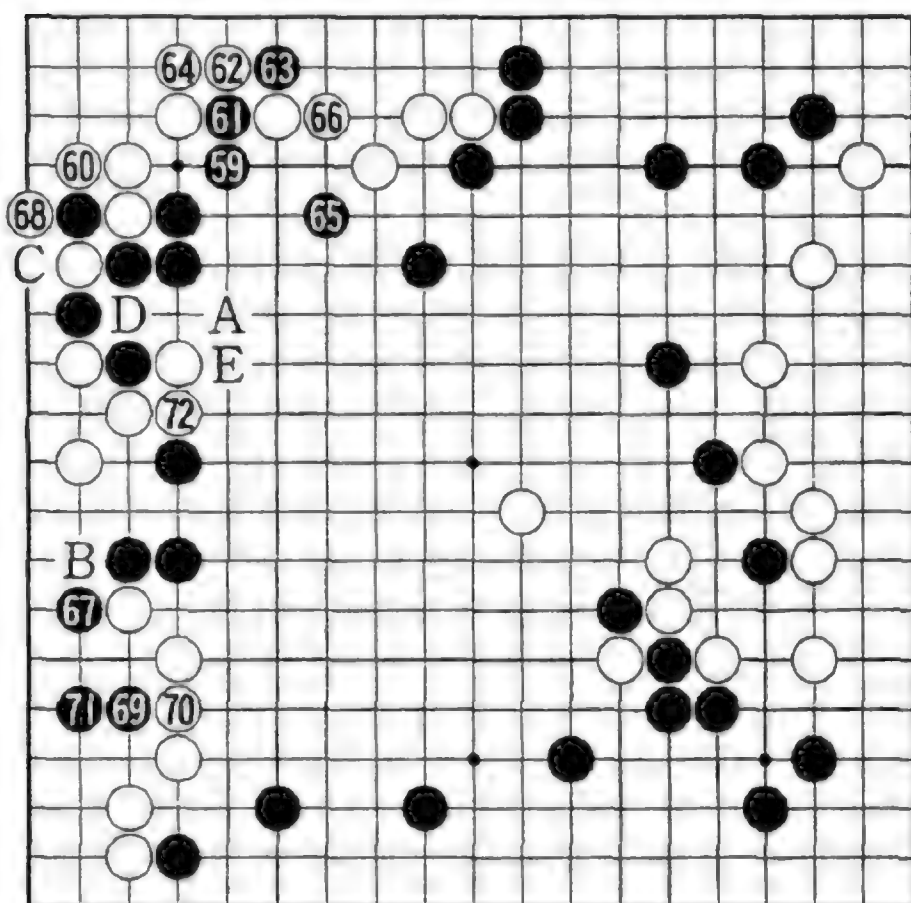
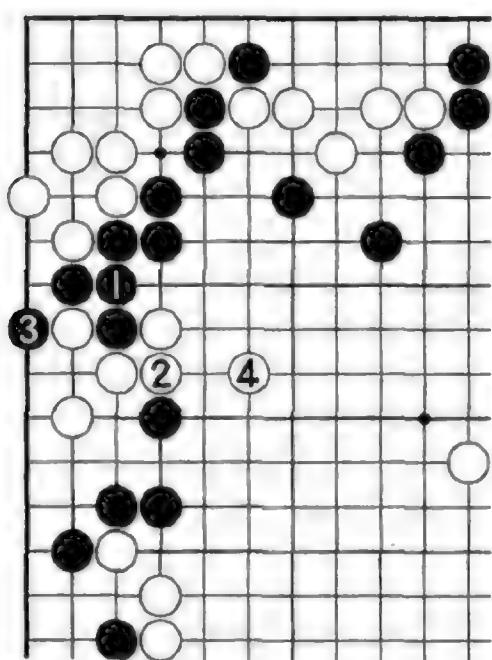


Figure 4 (59-72)



Dia. 3

Figure 4 (59-72). A feeler in the corner

Black 59. If Black doesn't play this peep, White A will put him danger.

When White answers 59 at 60, capturing at 68 and linking up with B become *miai*, so

White no longer has to worry about his left-side group.

Black 67. If Black captures at C instead, then White B, Black 72, White D, and Black E follow, and White is satisfied.

Black 71. Connecting at 1 in *Dia. 3* would also be a good strategy. If White 2, Black ataris at 3; compared to the game, where White links up on the edge, this is a more territory-oriented strategy for Black. However, his positions become thin when White jumps to 4, so one cannot say which is better. Descending at 71, aiming at harassing the corner, is, after all, more in keeping with Chikun's style.

White 72 is a key point.

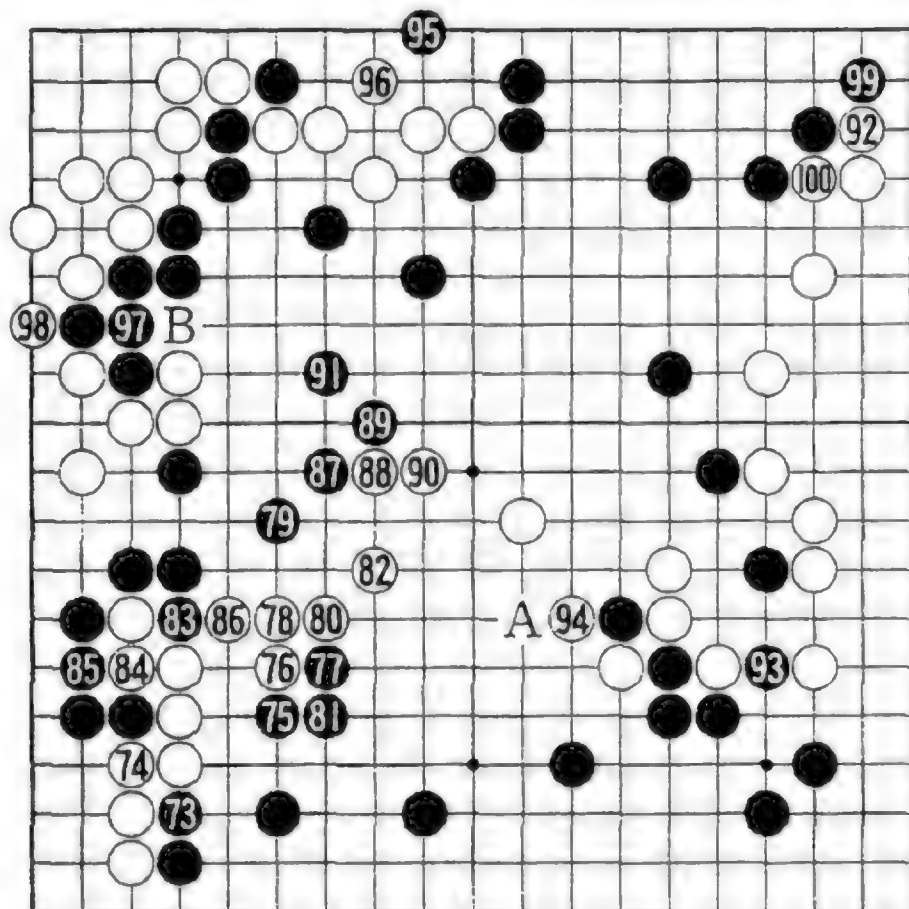
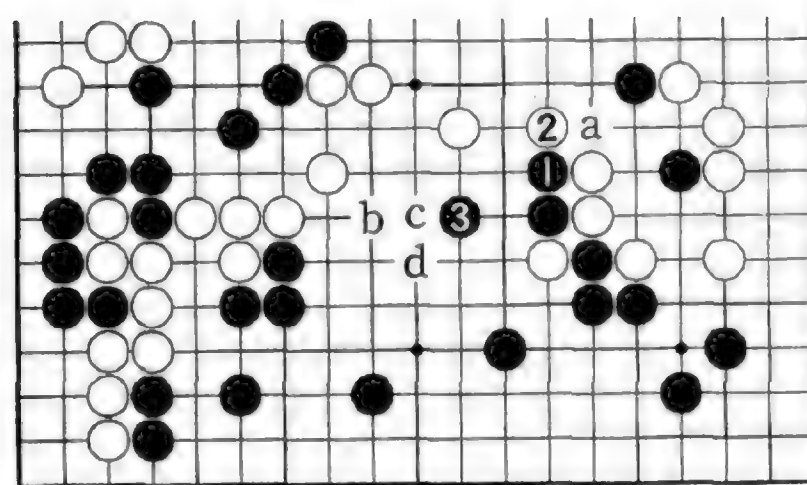


Figure 5 (73-100)



Dia. 4

Figure 5 (73-100). The flow begins to favour White.

The sequence from 73 to 91 is what you'd expect. The position is still even. You could say that the player who's stronger at the

endgame will win.

Isn't the exchange of 93 for 94 a bit of a minus? Using 93 to extend at 94 is not good, as White gets a nice move in the contact play at A, but I think following *Dia. 4* is better than 93. Black pushes up at 1, then jumps to 3, leaving a cutting point at 'a'. Permitting Black to jump to 'b' as well would be unbearable, so White will attach at 'c', but Black answers that at 'd' and has no problems.

When White takes hold of the black stone with 94, the game feels a little disagreeable for Black.

Black 97 becomes the losing move. In this position White will answer in the same way, at 98, even if Black plays 97 at B, and losing this *sente* move invites misfortune later. Labeling 97 the losing move may look like retrospective wisdom, but there is no need to play it now, so one is entitled to criticize it.

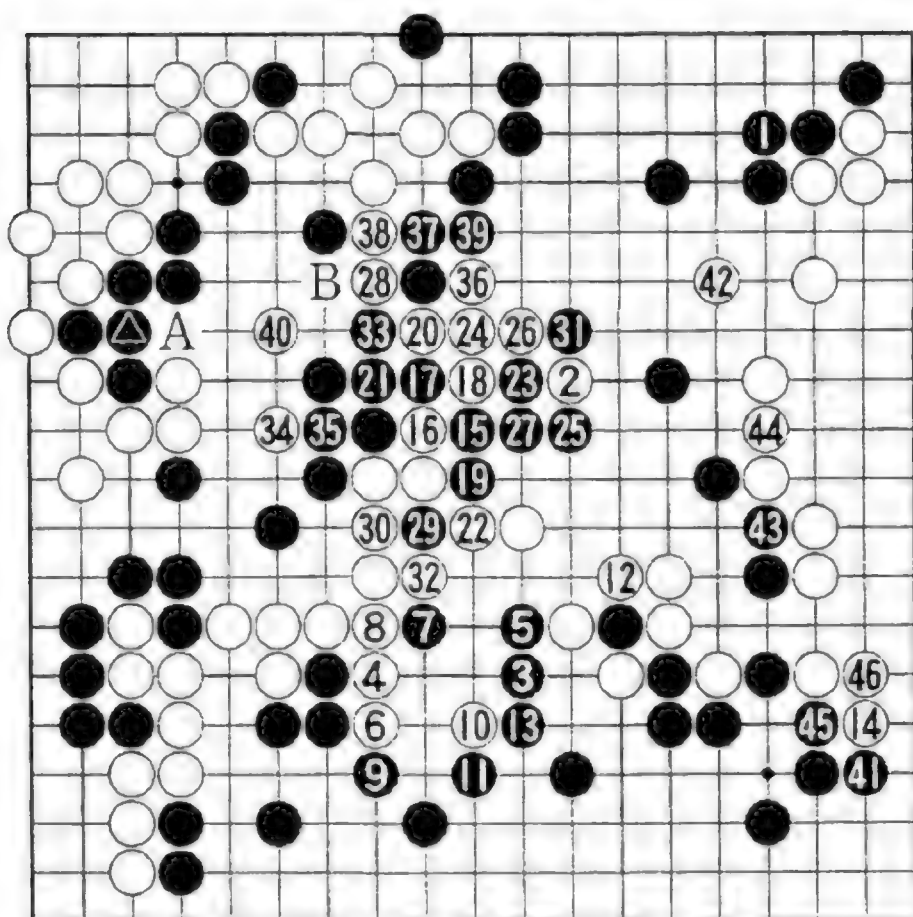


Figure 6 (101-146)

Figure 6 (101-146). No prospect of success

Black 15 is unreasonable. White pushes up and cuts with 16 and 18, turning the game at one stroke into a loss for Black. If instead Black had played 1 and 3 in *Dia. 5*, the game would still have been close. But perhaps Chikun believed that he had no prospect of winning after White 6.

Black 31. Even if Black connects at 32, White will connect at 31, and either Black's centre group or his left-side group will perish. White easily wins any *semeai* between

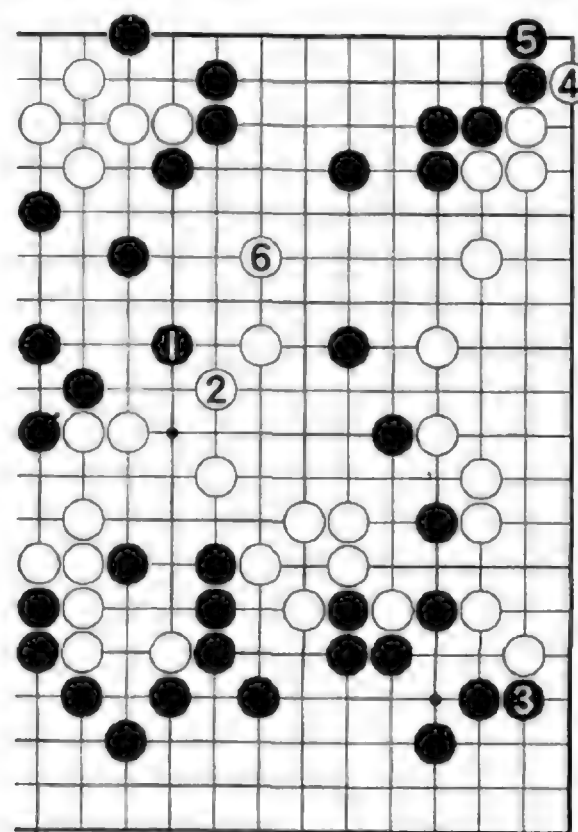
the large groups.

The trade to 40 is decidedly favourable for White. Note that if Black could move the marked stone to A, he would be able to avoid capture by answering White 40 at B; that in turn would make Black 15 a valid move.

In the result in the game, Black might even be behind on the board. The impression this game leaves with one is Lee's dexterity in dictating the game on his terms right from the opening.

Black resigns after White 146.

(Kido, June 1993)



Dia. 5



Lee Chang-ho makes a good start with a characteristic win against Cho.

Game Two

White: Cho Chikun

Black: Lee Chang-ho

Played on 24 April 1993.

Commentary by Michael Redmond 7-dan.

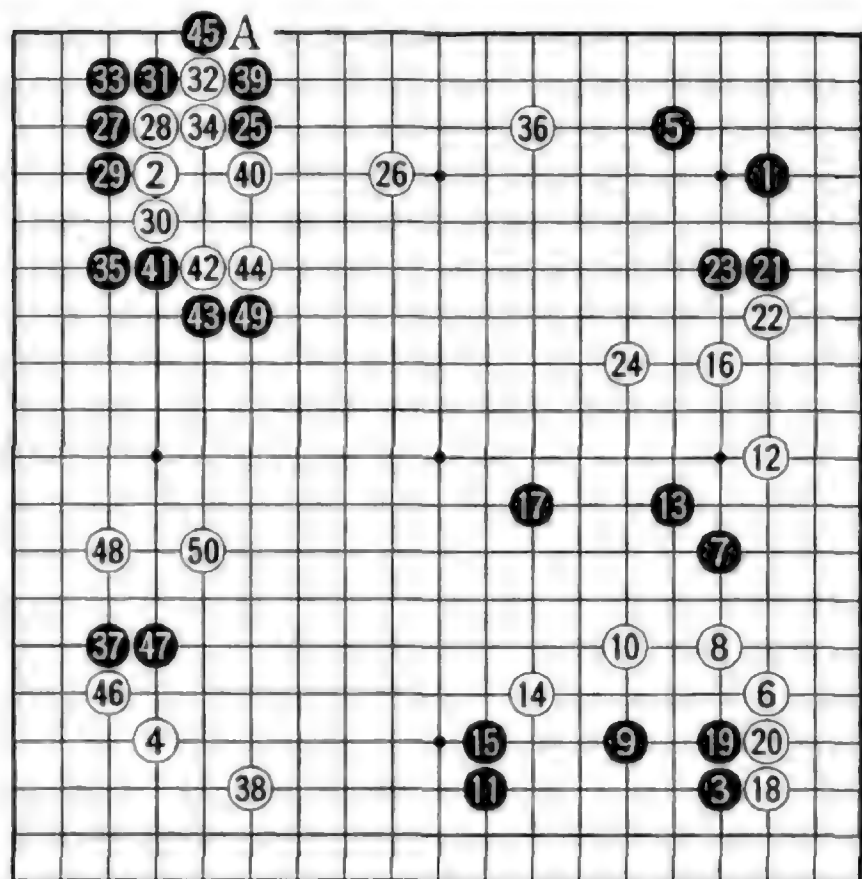


Figure 1 (1-50)

Figure 1 (1-50). Lee makes a satisfactory start.

White 10 is a Cho innovation (White usually slides into the corner), but the result does not really seem to be good. Black is satisfied with taking *sente* with 19 so that he can switch to 21. His shape at the bottom with 15 and 19 is quite solid. After 24, I would prefer to hold black.

White 42 should be at A. White 40 and 42 are overconcentrated, weak at taking territory and leave bad *aji* — in fact, it's hard to find anything good to say for them. White suffers a definite loss in the play here.

Black 49 at 50 would be more natural, but 49 shows that Lee is satisfied with his game.

Figure 2 (51-70). Funny shape, but . . .

White 54 may look like funny shape, but if White plays at 1 in *Dia. 1*, Black 2 becomes the vital point. Even though White intercepts with 3 and 5, he can't get a ladder with 7.

White 56 is preparation for 58 — if Black answers 58 with an *atari* above 54, then a *hane*, we get the same shape as the diagram, but 56 creates a ladder.

Black 61 is very big territorially; if White

played 63 instead, Black couldn't expect to make any territory here. Black 61 also changes the balance of power: neither the white nor black centre group is settled. Reinforcing with 66 is advisable.

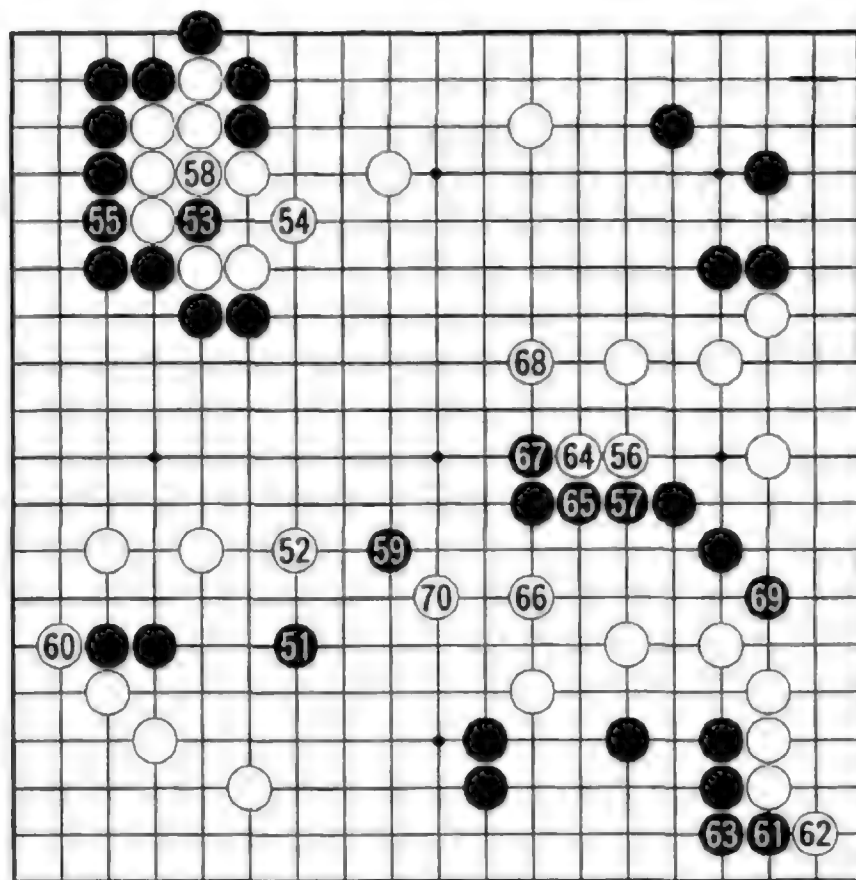
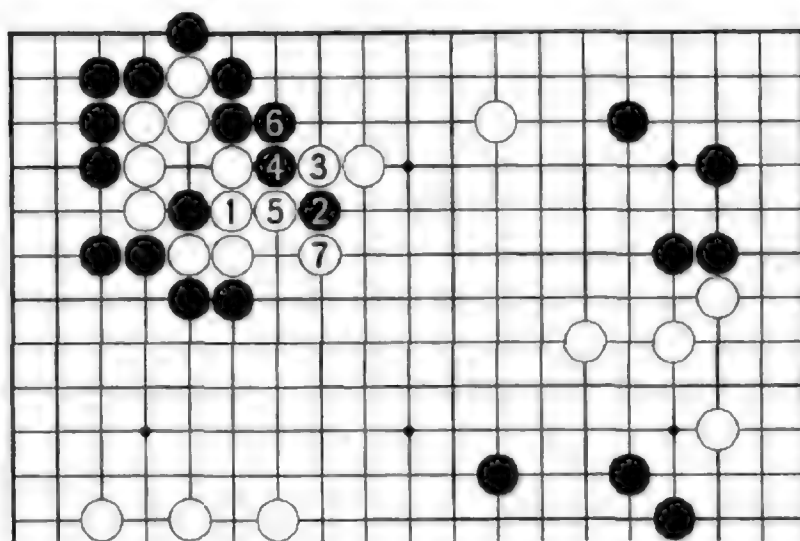


Figure 2 (51-70)



Dia. 1



Cho Chikun

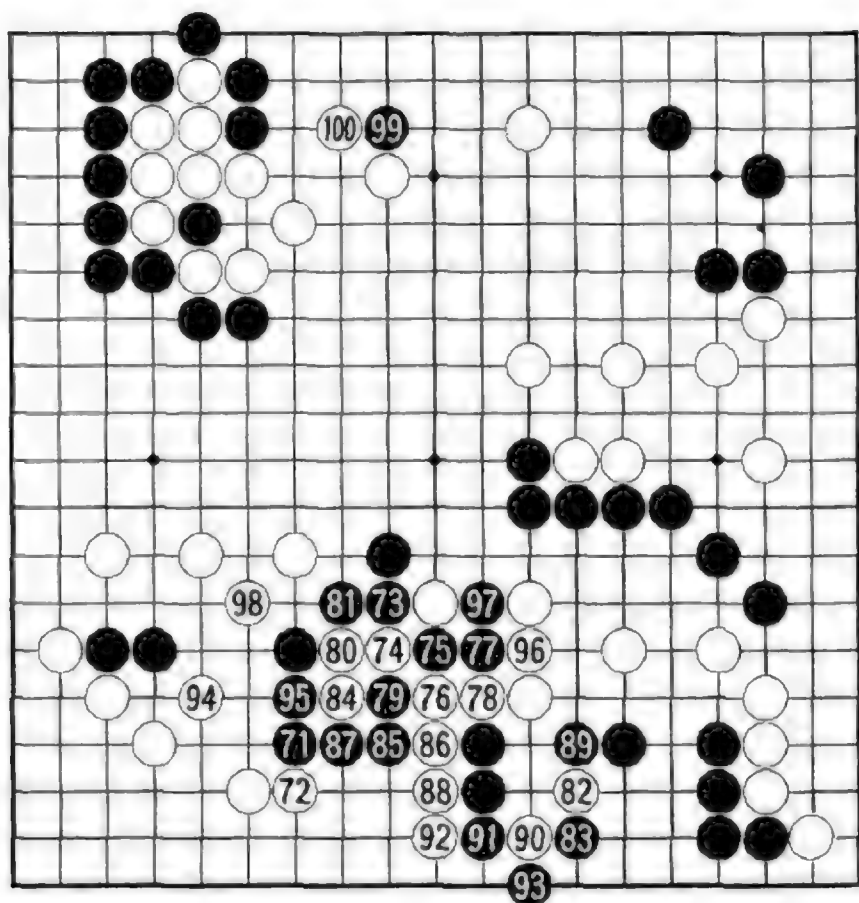


Figure 3 (71-100)

Figure 3 (71-100). Clever play

White 74 and 76 initiate a clever sequence. White 82 and 90 play a part in securing a connection to the left in *sente* up to 92. The whole sequence up to 98 is well played by White, but that's not to say that Black is dissatisfied. He gets *sente* after White 98 and switches to the very big move of 99.

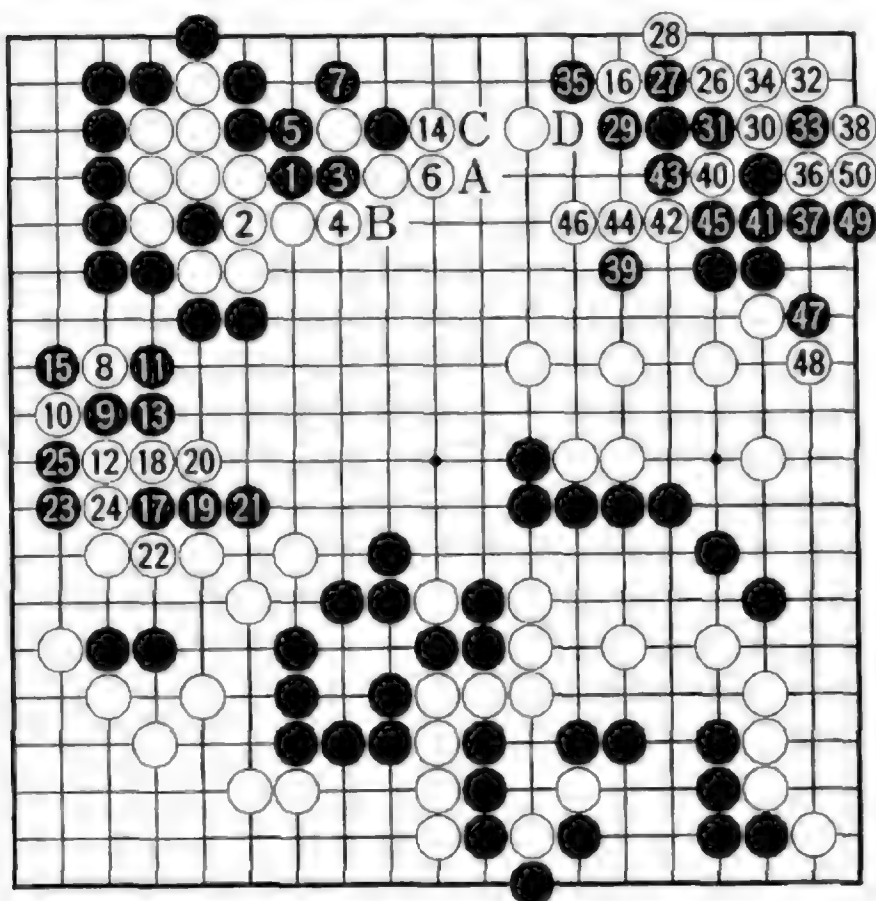


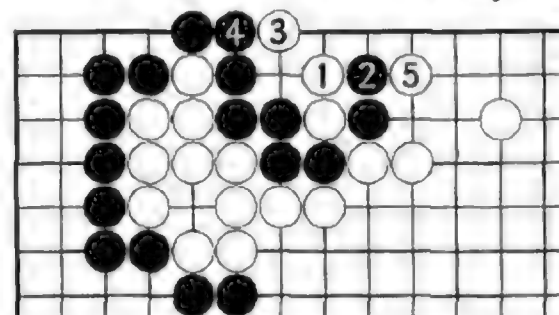
Figure 4 (101-150)

Figure 4 (101-150). Lee goes badly wrong.

Black 7. If omitted, White captures as in Dia. 2.

White 8. Black has the very severe threat

of A, which would be a ladder break for the cut at B, but White ignores it. If he defends at 14 now, Black will extend to 12, the last large point. White has to play first on the side to be in the game territorially.



Dia. 2

Black 13. This is a chance to play at A, but Black doesn't, because he is confident he is ahead. If he did play at A, White C and Black B would initiate a very tough fight for White.

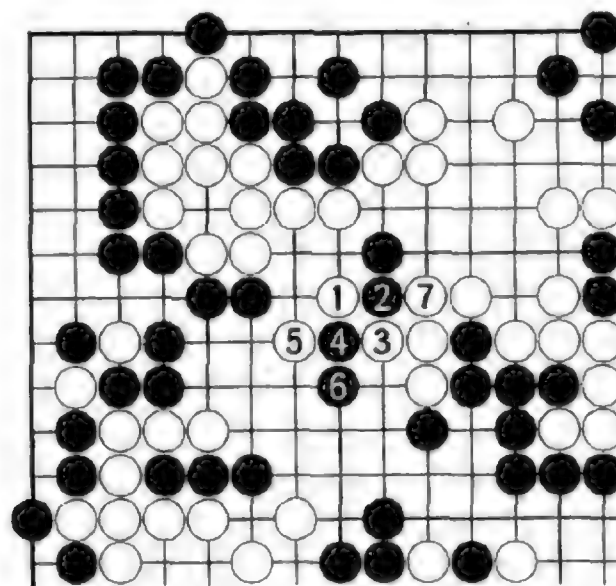
Black 17 is a big mistake: it must be at 29. If White answers that with 27, Black blocks at 26, White plays D, and then Black can *tenuki*, having secured a 15-point corner. In the game, White takes the corner in *sente*.

White 30 is severe — perhaps Lee made an oversight here.

Black 39 could have lost the game — it should be at 44. Lee overlooked White 42. Now that Black's 15-point corner has disappeared, White has the lead.

Black 43. If at 44, White plays D, which spells disaster for Black. (If Black captures 16, White wedges in below 29.)

Black 47 and 49, abjectly scrambling for an eye, are terrible for Black — the kind of thing you see in handicap games.



Dia. 3

Figure 5 (151-200). Cho's missed opportunities

Black 69 is another reason why Black wanted to play 17 in the previous figure.

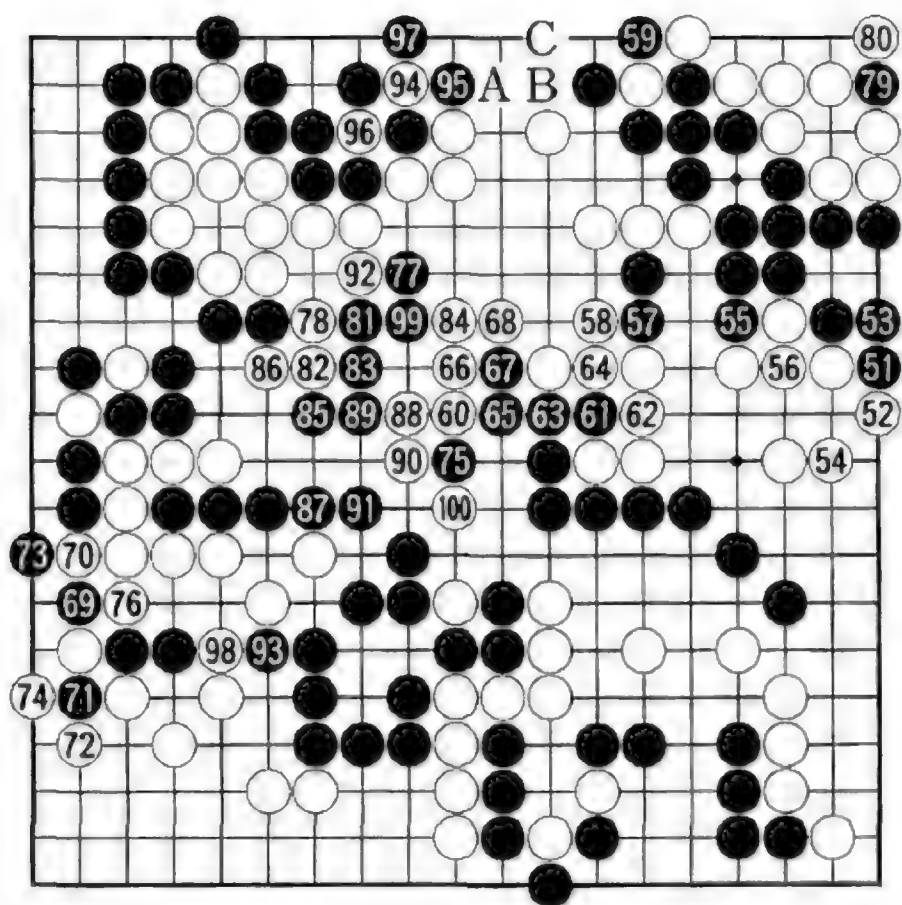
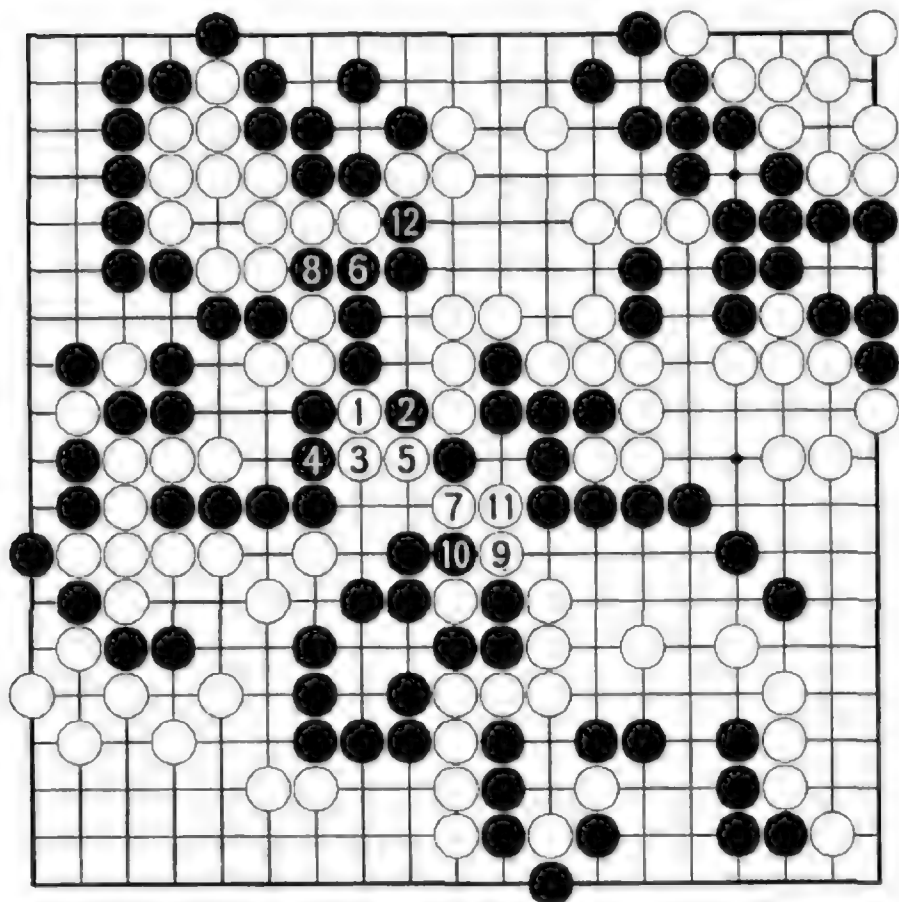


Figure 5 (151-200)



Dia. 4

Black 77. Black was behind, so he played this do-or-die move. If White answered at 81, I suspect that Lee was ready to resign.

Dia. 3. White 5 is a crucial *atari*: it stops Black from extricating himself.

White 78. Cho was probably short of time, which is perhaps why he compromised with 78. Even so, White was still ahead.

White 88 is another chance for White. If he played at 1 in *Dia. 4*, a large-scale *furi-kawari* (trade) would follow. Note that Black 6 is a good move, but the result is good for White. This would finish off the game. Per-

haps Cho stopped reading after 6. Note that if Black resists with 10 at 11, White takes three stones, Black cuts at 10, White takes the *ko*, and Black doesn't have enough *ko* threats.

The conclusion is that Black 87 was an overplay, but he was behind anyway. Lee had a lucky escape.

White 94 and 96 are the losing moves. Omitting these two moves and playing immediately at 98 instead would have won. If Black then plays 95 and White blocks at A, White gains two points compared to the game. When White does play 94, he must be prepared to continue by descending at 97 or else 94 is meaningless. Black will answer White 97 by extending at A, but then White pushes through at B, Black plays C, and White fights the *ko*; he seems to have enough threats to win it. If Black ignores White B to connect at 96, White descends at C, which is *sente* on both sides — a disaster for Black.

There are no mistakes in the endgame after this, so White 96 decided the game.

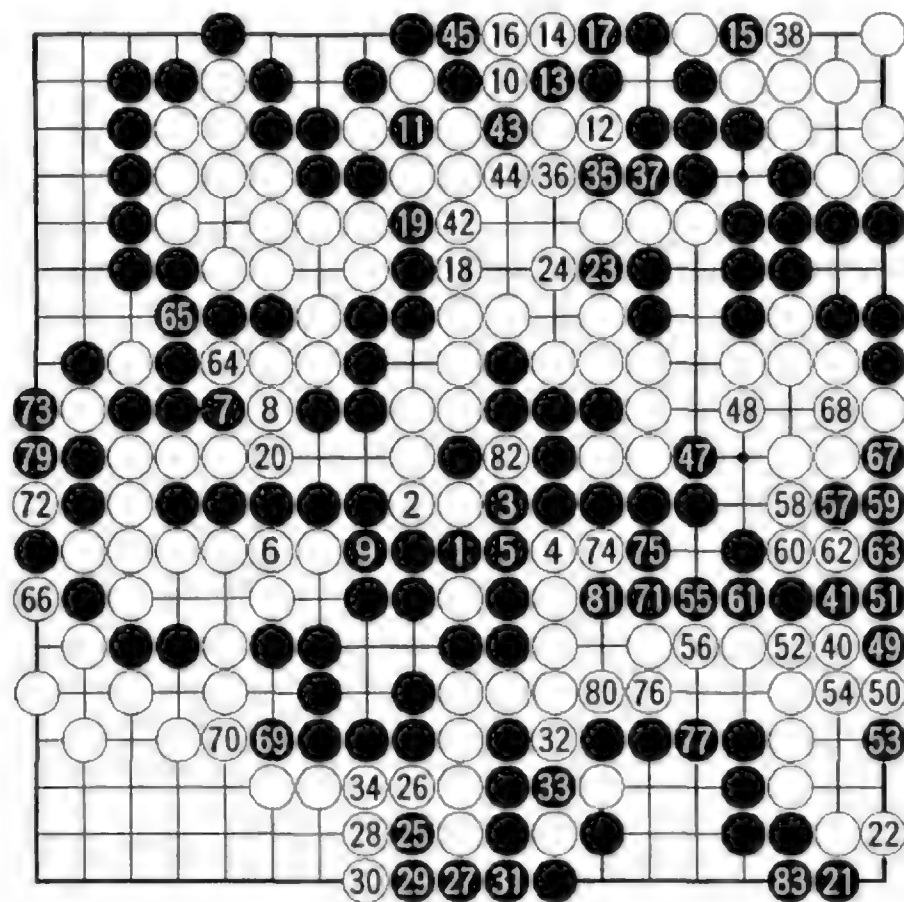


Figure 6 (201-284)

39: connects (left of 15); 46: connects (at 43)

78: connects (below 72); 84: connects (left of 82)

Figure 6 (201-284). The first half-pointer

White 18. If omitted, Black cuts at 19, forcing White 20, then jumps in (right of 18).

This was the first of Lee's half-pointers.

Black wins by $\frac{1}{2}$ point.

Game Three

White: Lee Chang-ho

Black: Cho Chikun

Played in Seoul on 8 June 1993.

Commentary by Ryu Shikun 5-dan. Report by Murakami Akira.

Kido had a reason for asking Ryu 5-dan to do this commentary. Ryu studied with Lee as an *insei* at the Korean Ki-in before coming to Japan, where he became a professional in 1988. Ryu is four years older than Lee, but at first he refused *Kido's* request, on the grounds that he wasn't qualified. It's true, of course, that his career achievements don't match Lee's, but if that were the criterion there wouldn't be anyone left to do a commentary. *Kido* wanted the insight of a personal friend of Lee's, so Ryu finally yielded.



Ryu Shikun

Born in Seoul on 8 December 1971. Disciple of Oeda Yusuke 9-dan. Became shodan in 1988, 5-dan in 1992, 6-dan in 1994. Won the Shin-ei (New Stars) tournament in 1993 and the Shun-ei (Young Stars) tournament in 1994. Has twice won the 4-dan section of the Kisei tournament (1991, 1992).

Ryu and Lee were both taught by Chong Yongson 6-dan. Ryu: 'We became *insei* at the same time, when Lee was ten and I was 14. We started out at 5- or 6-kyu. Within a year Lee had become the top *insei*. I used to play

him three or four times a month, so altogether we've probably played about 50 games. I think I lost more than I won. He also got promoted a little faster than me.'

After a year and a half, Ryu came to Japan and Lee became a disciple of Cho Hun-hyun.

Ryu is surprised by Lee's reputation for taciturnity in Korea (one of his nicknames there is Stone Buddha). 'Lee was quite talkative with me. I even thought he was cheeky.' Actually, a Korean reporter relates how surprised he was to see Lee talking animatedly with Ryu and Cho Sonjin, another young Korean at the Nihon Ki-in, on one of his trips to Japan. Perhaps Lee's taciturnity is a defensive reaction to the extraordinary prominence into which he has been thrown.

In Japan Ishida Yoshio's precision in counting earned him the nickname of 'computer', but Lee goes him one better. The term applied to him in Korea is 'divine calculation'. Computers sometimes break down, but Lee never (well, almost never).

Ryu: 'When I was a child, I believed that go was not a game of calculation, but Lee would accurately count one-point wins. At first, that astonished me. Nowadays, he's already calculated the score even when there are still various places to fight. And his figures are quite accurate. He virtually never makes a mistake in the endgame.'

Because Lee has confidence in his endgame, his play is not flashy. He reads well, but he won't play a move unless he's quite sure of how it will turn out. Instead of taking risks, he chooses the path that will give him a sure endgame win. The fact that he virtually monopolizes the *haya-go* titles is evidence of how well he reads.

Rin Kaiho, who lost the previous Tong Yang Cup final to him, had the following comment: 'When you're playing Lee, you get nervous if the game is close. But if you do anything the slightest bit unreasonable, he immediately pounces on you. There's just no way to handle him.'

Ryu apparently had the impression that Lee didn't try anything special in the *fuseki*, but found on looking at his recent games that he seems to be studying the opening a lot and that he's trying out various different

opening strategies. Perhaps that shows that his game is gaining in breadth.

Putting aside his talent at calculation, perhaps the main factor in Lee's strength in endgame contests is his exceptional patience. A lot of patience is needed to resist temptation along the way and to keep postponing the decisive fight. Patience has to be accompanied by stamina, of course. His physique shows that he has the stamina.

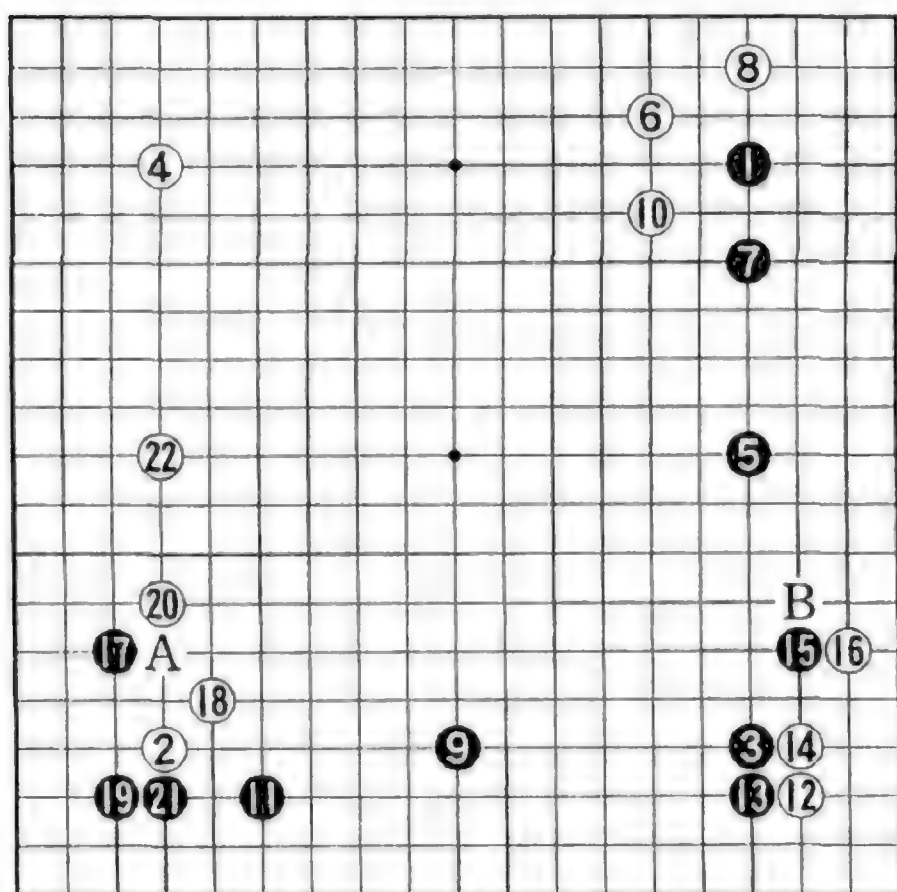
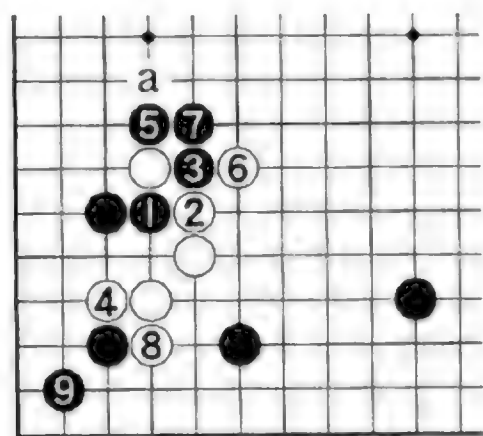


Figure 1 (1-22)



Dia. 1

Figure 1 (1-22). Could have cut

I am a very long way from possessing the ability to analyse a game by these two. I would like just to follow the flow of the game, adding my own interpretation while referring to the comments given by Cho Hun-hyun in *Go Weekly*.

White 12. If at A instead, Black will probably defend his corner with 12.

Black 17. If Black answers 16 at B, he will end in *gote*, letting White switch to A.

Black 21. Apparently pushing along and

cutting with 1 and 3 in *Dia. 1* would be more severe. When White plays 8, Black 9 puts him on the spot. If White switches 4 to 5, Black 7, White 'a', and Black 4 follow, which also looks tough for White.

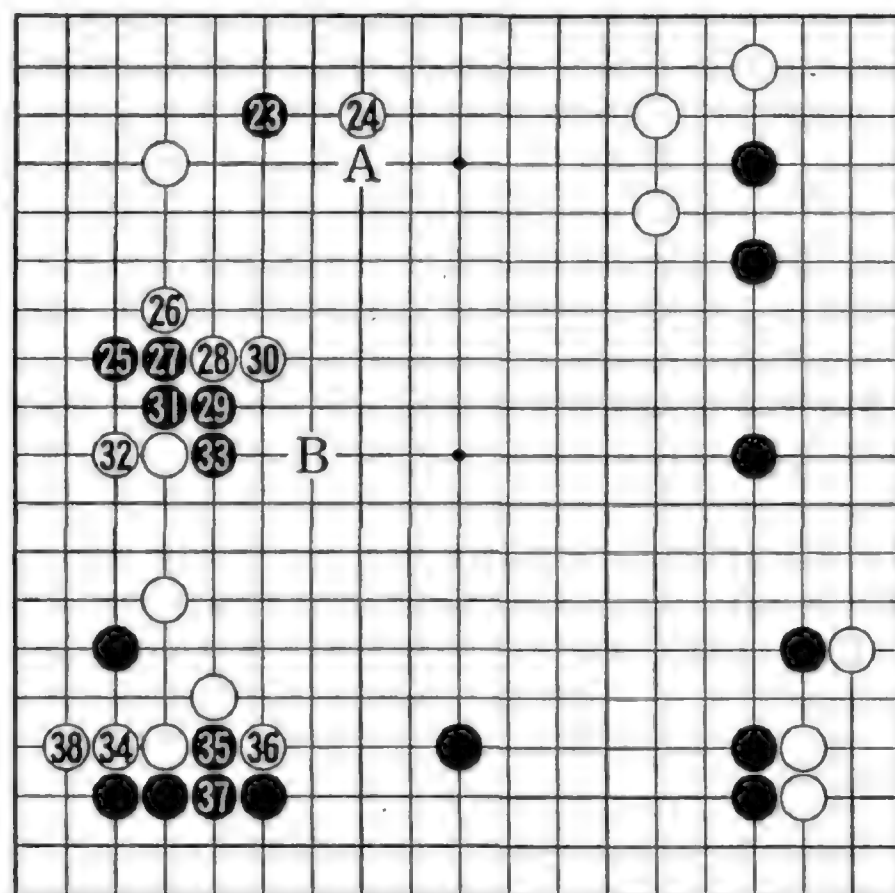
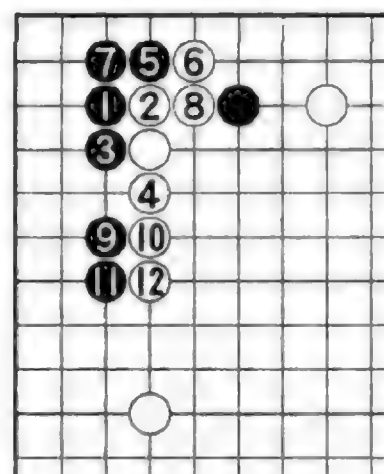
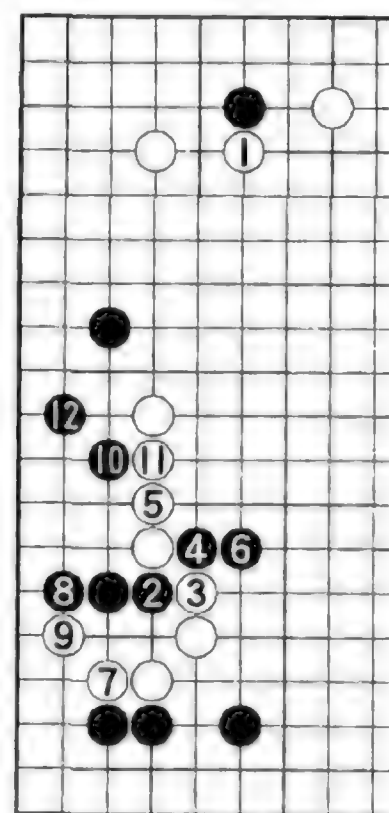


Figure 2 (23-38)



Dia. 2



Dia. 3

Figure 2 (23-38). A concealed aim

Black 25 surprised me. Locally, the usual strategy is to enter at 1 in *Dia. 2*, but perhaps Cho disliked the prospect of White's making a large *moyo* at the top by pushing down with 10 and 12. Another possibility is to attach at A in the figure, but it's not clear what will follow.

White 26. It's easy to guess Black's strategy if White attaches at 1 in *Dia. 3*. He'll

probably cut with 2 and 4. When White plays 7, Black can descend at 8; if White 9, Black 10 and 12 work perfectly. Any other sequence is inconceivable.

White, of course, refuses to follow orders with 26.

After the continuation to 38, the only thing I would think of would be fleeing into the centre with a move like B. However, Cho has a surprise for us.

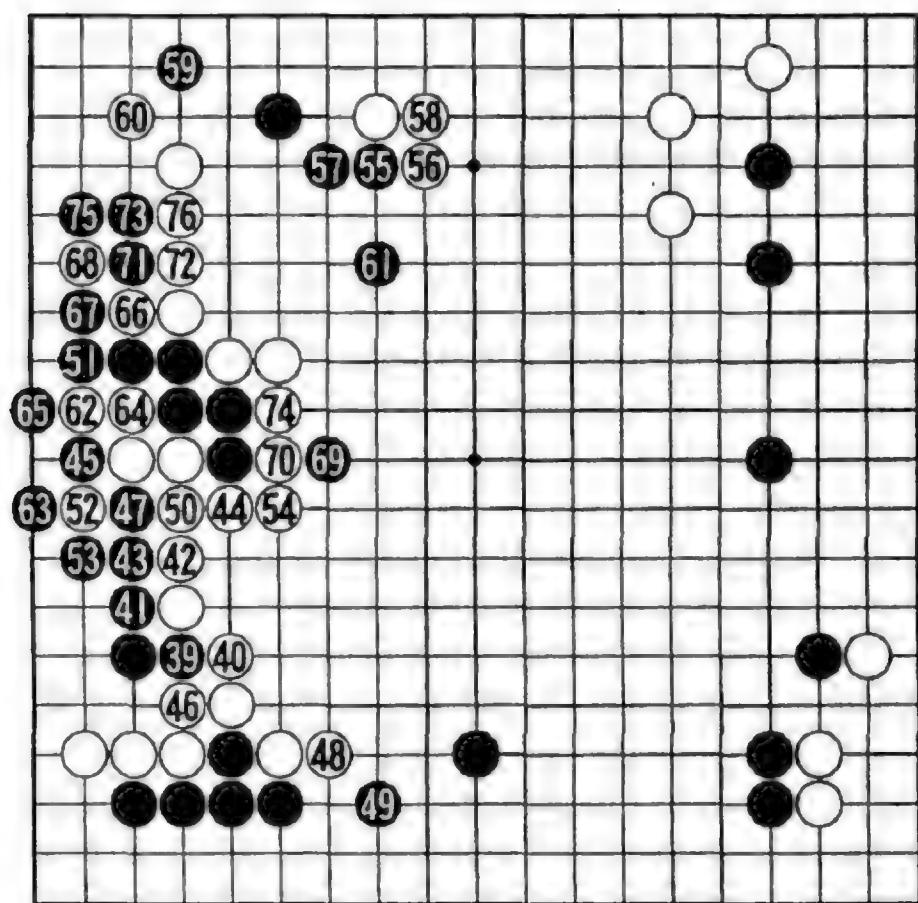
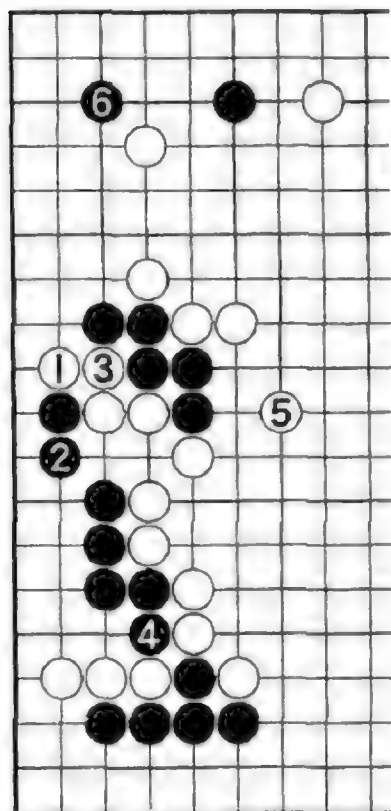
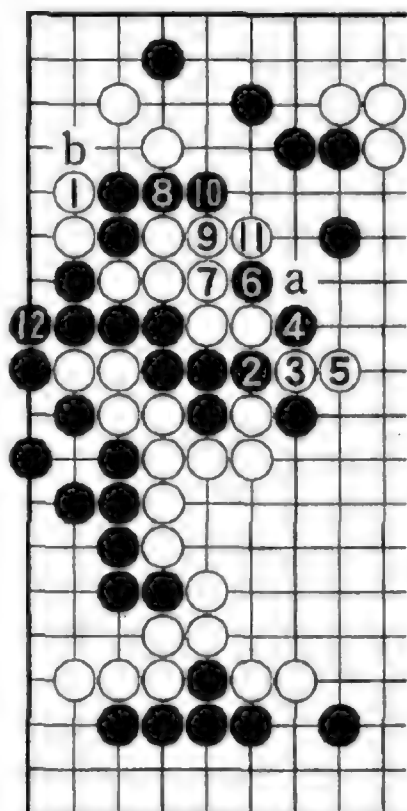


Figure 3 (39-76)



Dia. 4



Dia. 5

Figure 3 (39–76). *Cho* in full cry

For a moment one refuses to believe one's eyes when one sees 39 and 41. Could such moves work? Well, they succeed brilliantly.

White 46. If White blocks at 1 in *Dia. 4*,

capturing three stones with 4 is big; if next White 5, Black 6 should be enough to secure the superior result. The five black stones still have some *aji*.

Black 51 is greedy: pulling back at 62 makes better eye shape. That would give Black an even better result.

White 74. White 1 in *Dia.* 5 is unreasonable. Black 2 to 12 makes *miai* of 'a' and 'b'.

Anyway, the play on the left side is a success for Black.

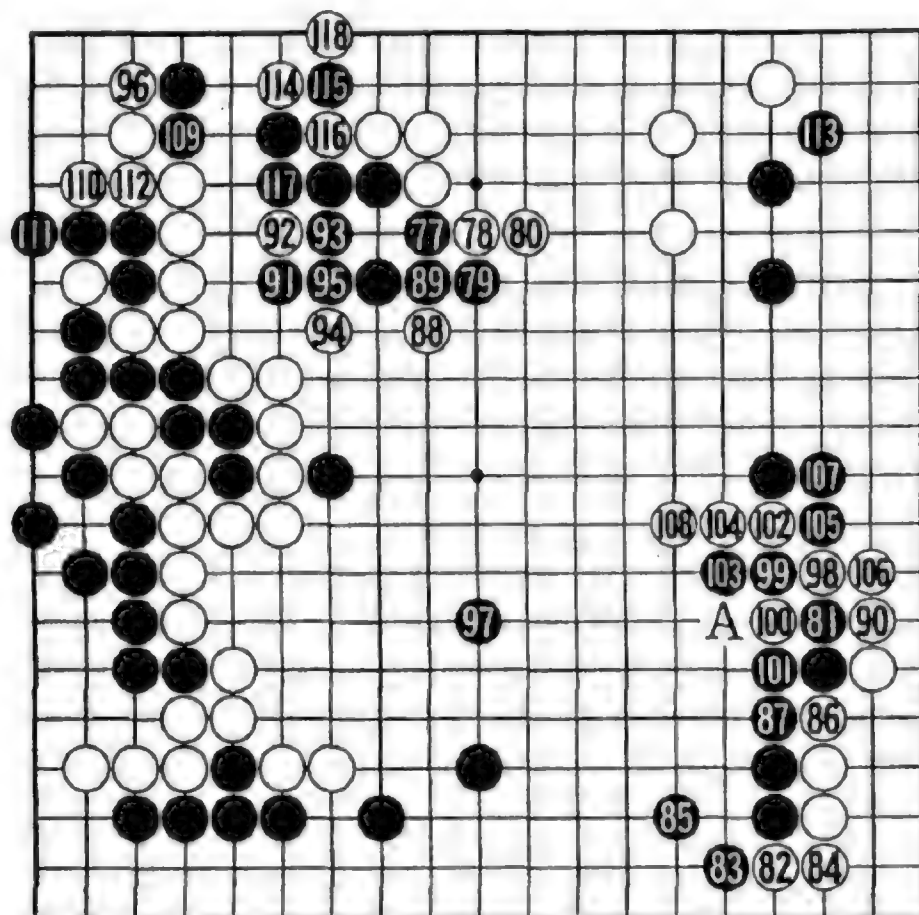
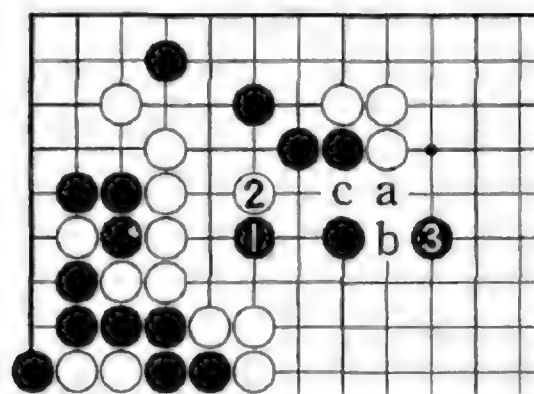


Figure 4 (77-118)

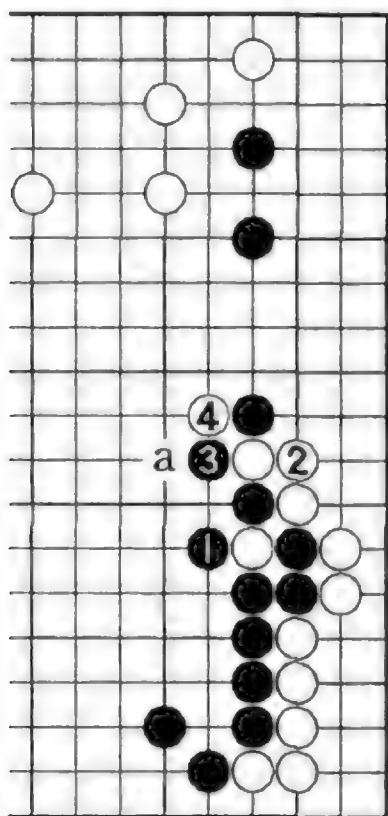


Dia. 6

Figure 4 (77-118). *Typical Lee play*

Black 77. Black could develop more rapidly by forcing with 1 in *Dia. 6*, then jumping to 3. Black 1 defends against White 'a', Black 'b', White 'c'.

Black 97 is a good two-space jump — Black still has the lead. White's thickness to the left doesn't work very effectively. However, White has solid territories at the top and on the bottom right — the game is certain to become an endgame contest. That puts the game right up Lee's alley.



Dia. 7

Black 103. Choosing between extending like this and capturing at A is very troublesome. After the continuation to 108, having 103 at A would make better *aji*, but if Black does play 103 at 1 in Dia. 7, White will probably connect at 2; if Black 3, White will cut at 4 and Black will suffer the *atari* at 'a'.

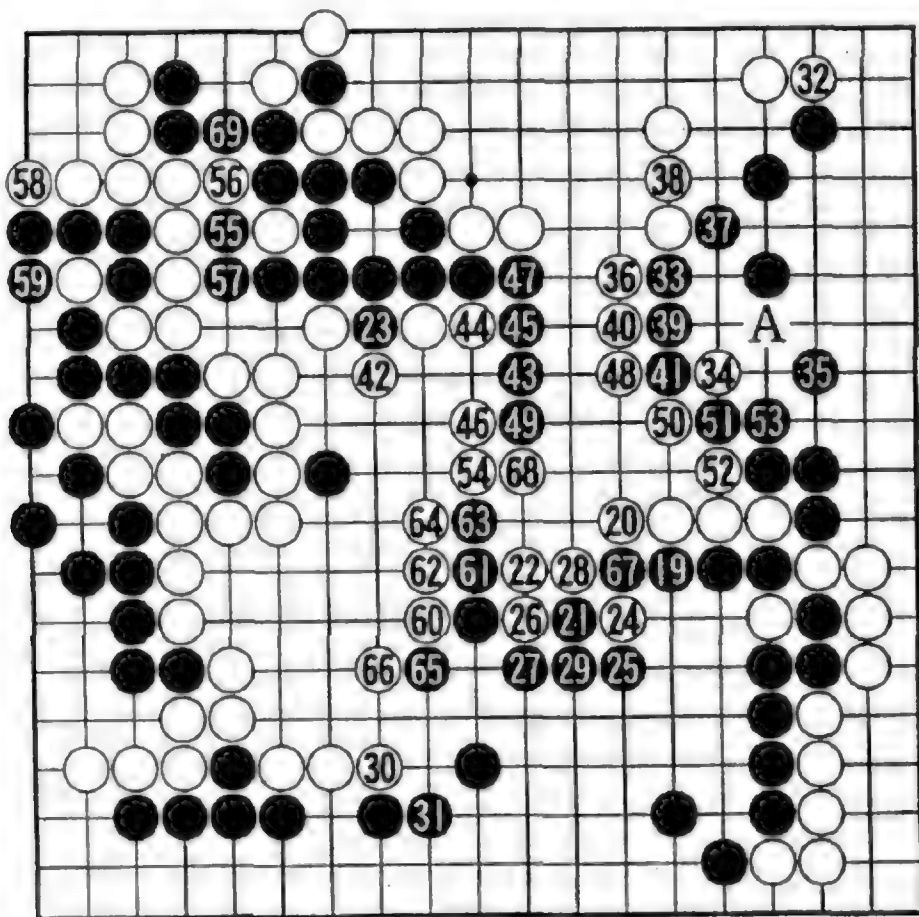
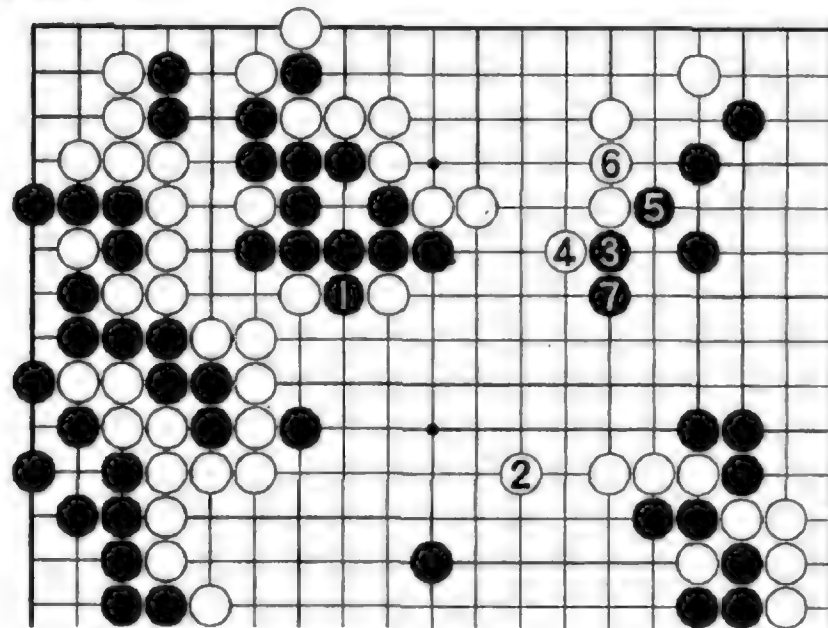


Figure 5 (119-169)

Figure 5 (119-169). The lead switches back and forth.

Enclosing the bottom with 19 and 21 backfires, giving White a chance to take advantage of Black. If he connects at 26 when White peeps at 22, White will attach at A, aiming at a double attack, so the black group

at the top will be exposed to danger. Black therefore has no choice about answering at 23, but then White flattens out Black's bottom territory with 24 to 28, on top of which Black still has to worry about his top group: it's clear that the lead has changed hands. In view of this, Black should have used 19 to eliminate his worries by pushing down at 1 in Dia. 8. White will probably play 2, so next Black can strengthen the other group at the top with 3 to 7; this would keep him a little ahead.

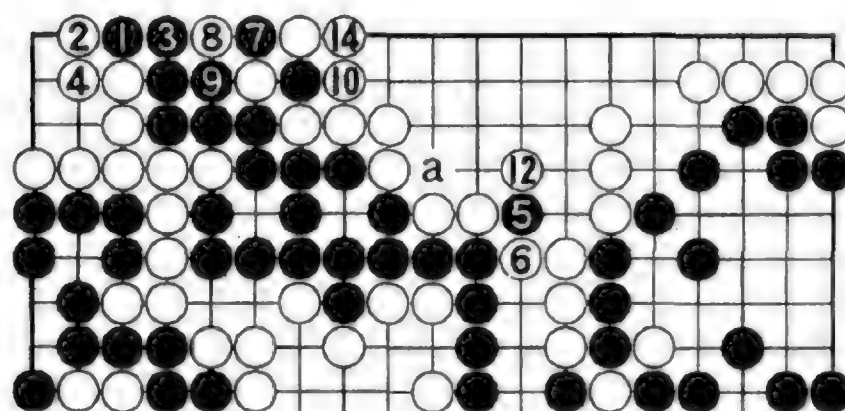


Dia. 8

White 32. This seems to be White's chance to attach at A, but even though he lets it slip, White 34 leads into the part of the game that is Lee's forte.

However, White 60 is one of Lee's rare misjudgements. Instead, White should capture two stones with White 69.

The cut of Black 67 is *sente*. When Black connects at 69, he has played two big moves. Though the margin is small, he has upset White's lead.



Dia. 9

11: ko; 13: ko

Figure 6 (170-232). A fatal mistake in timing White 76 and 78 are shrewd.

Black 101 is a mistake in timing: it be-

comes the final losing move. The correct order of moves is to play 1 and 3 in *Dia. 9* first. In this case, Black can follow 5 with 7 and 9; after Black captures the *ko* with 11, White has no choice but to capture with 12. Compared to the figure, the result to 14 represents a gain of one or two points for Black. If White uses 12 to connect (left of 10), Black can cut at 'a' — please confirm the continuation for yourself.

Because Black starts out with the *hane* of 101, White seizes the opportunity to give way with 106, so 101 becomes a loss without compensation (*mochikomi*).

My guess is that Lee overlooked the sequence in *Dia. 9*. I think he probably woke up to it when Black played 101; this must have shaken him, but he played 104 to gain time and discovered the correct answer of 106.

In the second game, Lee also won a bad game by half a point. He's certainly a hard man to beat.

White wins by ½ point.

(Kido, August 1993. Translated by John Power.)

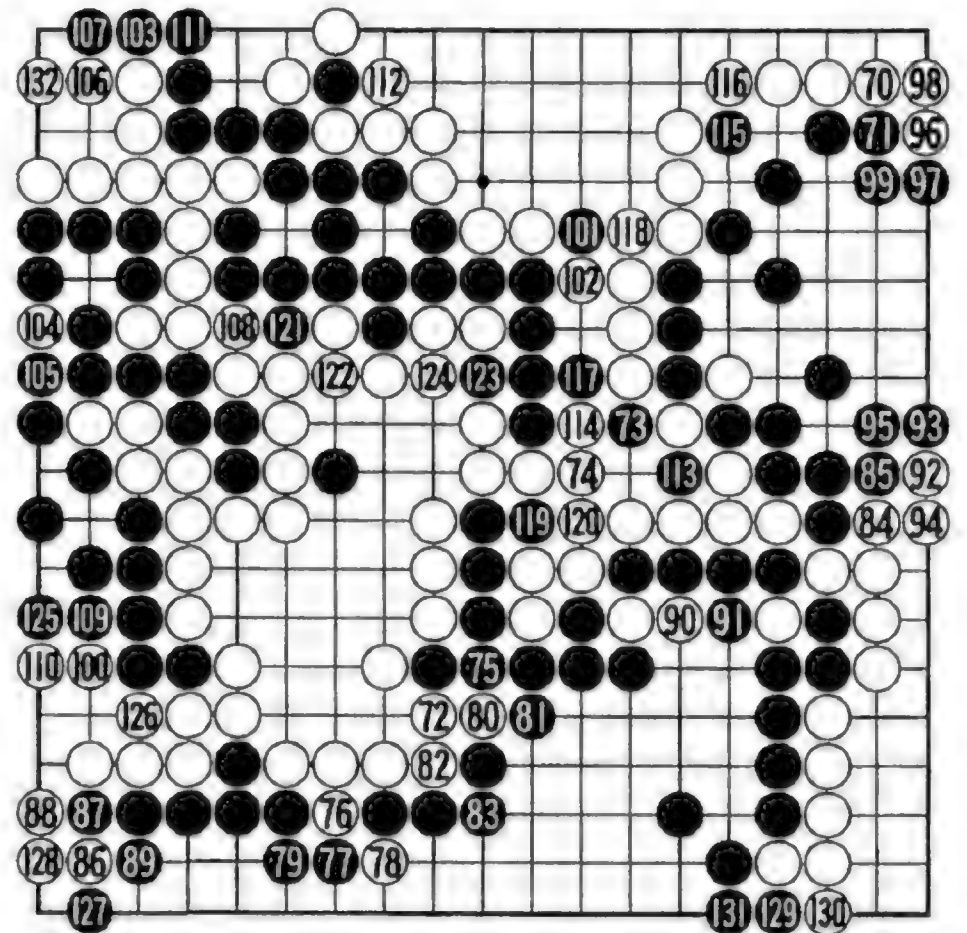


Figure 6 (170-232)



Cho and Lee shake hands at the awards ceremony. Lee doesn't seem impressed by his victory — he maintains his poker face to the last.

Michael Redmond's Tong Yang Triumph

In November last year Michael Redmond scored what is undoubtedly the biggest triumph of his career so far, a win over the reigning Ing world champion in the second round of the 5th Tong Yang Securities Cup. *Go World* interviewed Michael to get his account of the game.

White: Seo Bong-soo 9-dan (Korea)
Black: Michael Redmond 7-dan (U.S.A.)
 Komi: 5½; time: 3 hours each.
 Played in Seoul on 18 November 1993.
Commentary by Michael Redmond.

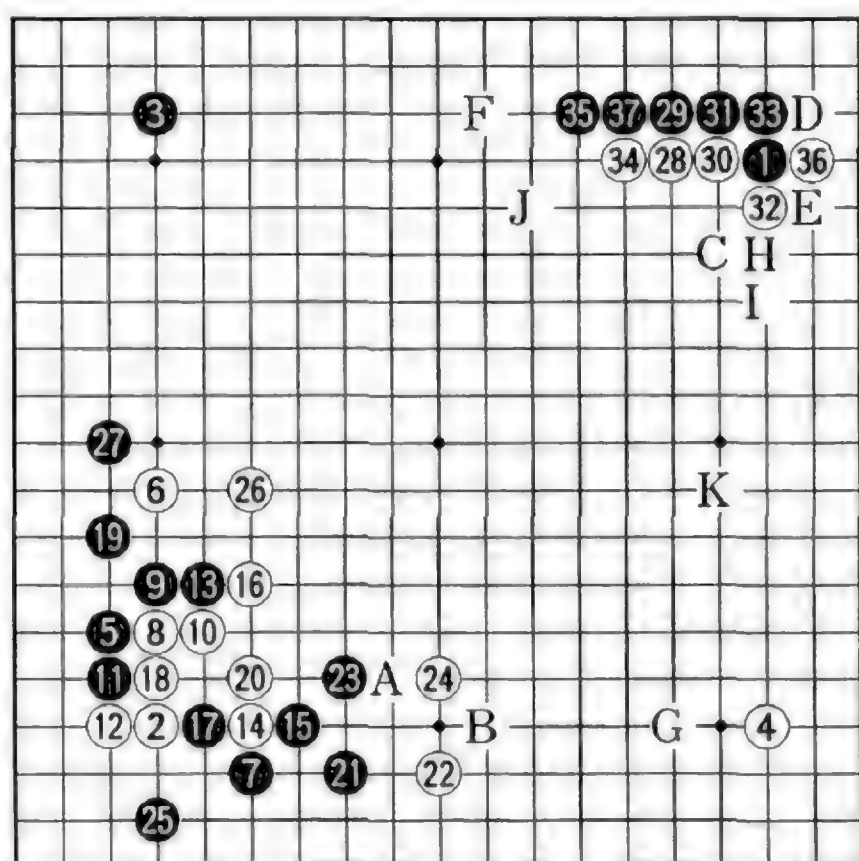
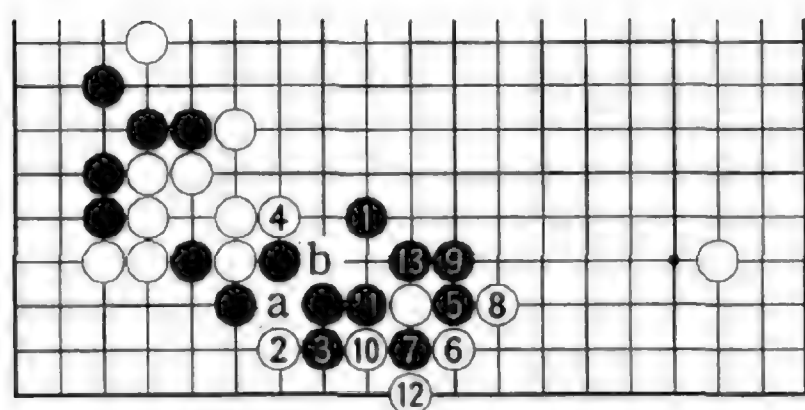


Figure 1 (1-37)



Dia. 1

Figure 1 (1-37). Early advantage to Redmond

The *joseki* in the bottom left corner has been popular recently and was one of Michael's favourite patterns at the time. However, White 12 here doesn't give White



Michael Redmond (photo from a TV tournament in Japan)

a good result, so it will disappear from professional play. Instead of 12, it is better for White to attach immediately at 14.

Once White plays 12, the continuation to 26 is forced for him. The continuation itself after 12 is reasonable for White, but the result is not good for him because of 12. White has lost his corner eye shape, so he has to play conservatively; he has also given up territory on the left.

Black 23 could also be at A, but Black doesn't like the prospect of White's peep at 2 in *Dia. 1*. Black does make shape with 3 to 13, but White is left with 'a'. If White wins the *ko*, capturing with 'b' will be *sente*.

The strategy in the game is more clear-cut. The virtue of 23 is that it makes *miai* of pressing at B and stealing the corner eye shape with 25 (White can get one eye but in *gote*). Michael felt that at this point he had a slight advantage.

Black 29. In retrospect, this is perhaps a little slack; it should probably have been at C. After the usual *joseki* when White attaches at 33 (Black D, White 31, Black E, White F),

Black could then invade comfortably at G. Michael considered this, but he decided to play 29 so as to let White make a *moyo* — 'If I then did a good job of erasing the *moyo*, I felt I'd have a good chance.'

Black 37 is an interesting way of answering 36. White is hoping that Black will block at D, making 36 a *kikashi* (forcing move). Instead, Black connects solidly at 37 and aims at the *aji* of H (or even I); White also loses the usual forcing move he has at J. Michael said that he would have played 36 at J or around K.

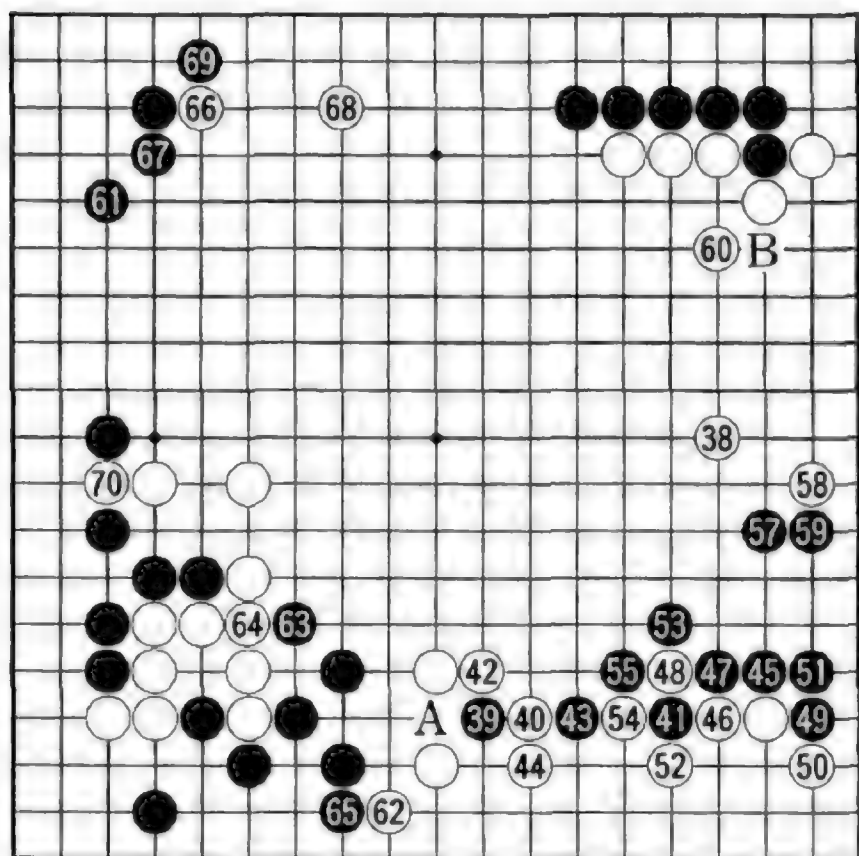


Figure 2 (38-70)
56: connects

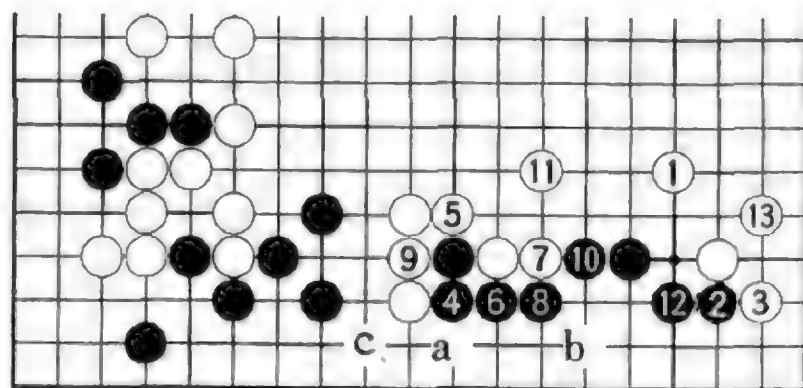
Figure 2 (38-70). A second success for Black

After White 38, Black has two directions to choose from in invading the *moyo*; the choice is difficult, so he first peeps at 39 as a probe. Making an approach move at 41 immediately would be the usual strategy, but if White connects at A, 39 becomes a *kikashi*, so Black will then switch to 41 (or perhaps 54); if instead White counters with 54, Black will push through at A and aim at Black B.

White 40 is the severest counter. Answering directly doesn't work well, so Black switches to 41.

White 42. The usual answer is 1 in Dia. 2. Black planned to live with the sequence to 12. If White later plays 'a', Black will answer at 'b', otherwise White 'c' will become *sente*.

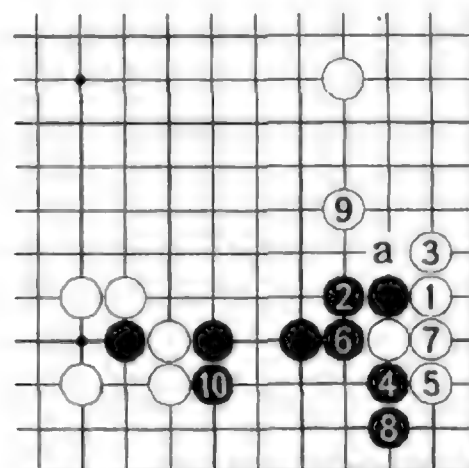
In this result, White is left with bad *aji* between 1 and 11.



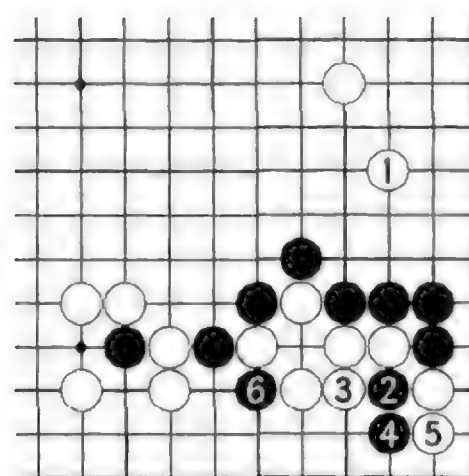
Dia. 2

Black 43. Black is already thinking of throwing away his two stones here (41 and 43): they are obviously *kikashi*.

White 46. White 1 in Dia. 3 would be more peaceful. However, Michael expected 46, from his knowledge of Seo's style.



Dia. 3



Dia. 4

Dia. 3. Note that White can't play 3 at 'a', as the ladder (Black cuts below 1, White ataris, Black 3) is unfavourable. Up to 10 Black settles his group. Even so, this seems better for White than the result in the game.

Black 49 is the key point.

White 56, connecting the *ko*, is forced. White would like to be able to attack at 1 in Dia. 4, but he has no answer to Black 2.

The result to 59 is worse for White than

Dia. 3 — he hasn't gained territorially and his top right side is weaker. At this stage, White was probably starting to feel a little uneasy about his game.

Figure 3 (71–100). The key point

Black 87 is very important: it's the key point.

White 94 aims at crawling at 95 next, but Black is happy to play 95. When White goes for a *moyo*, as he does here, Black naturally picks up territory on the edges of it.

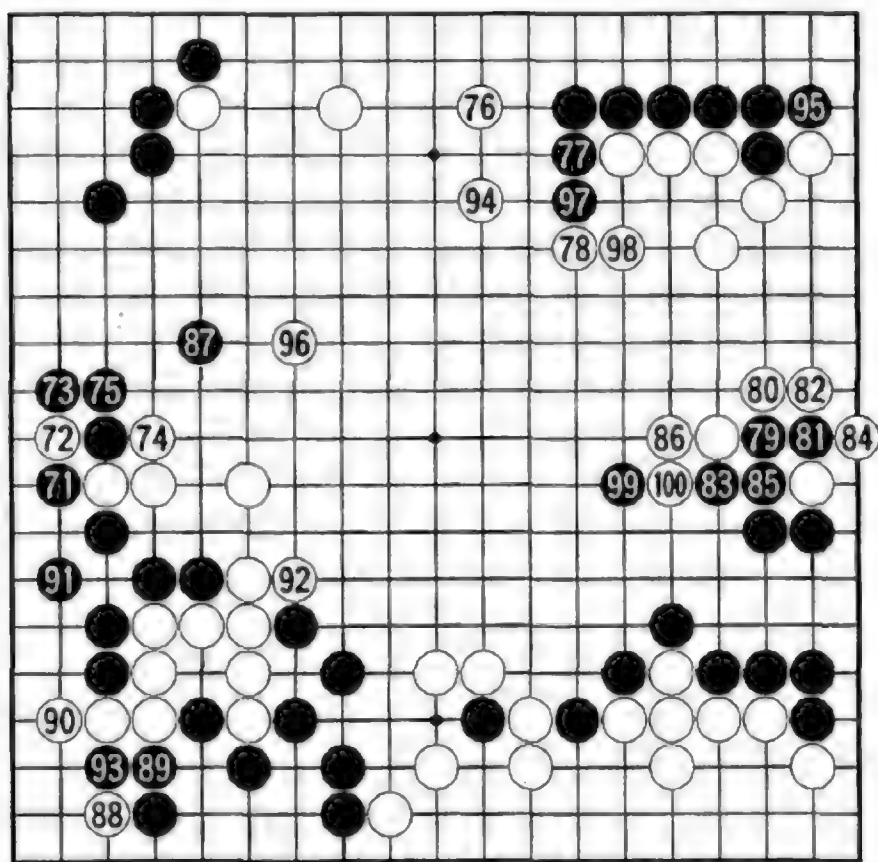


Figure 3 (71–100)

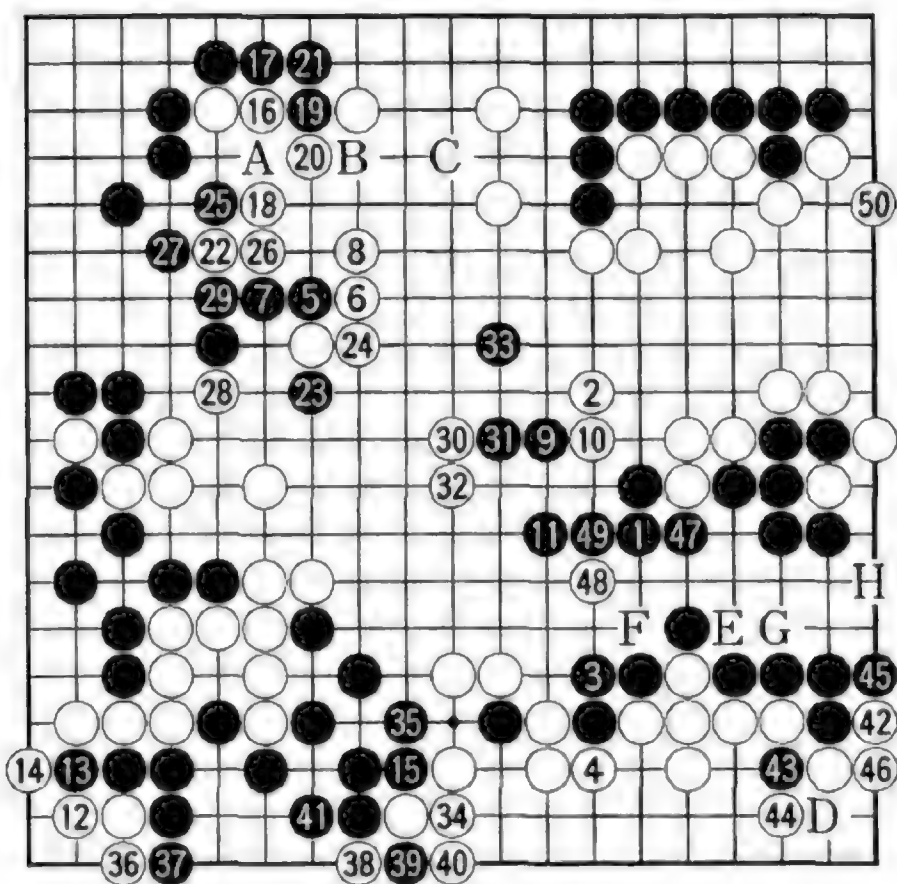
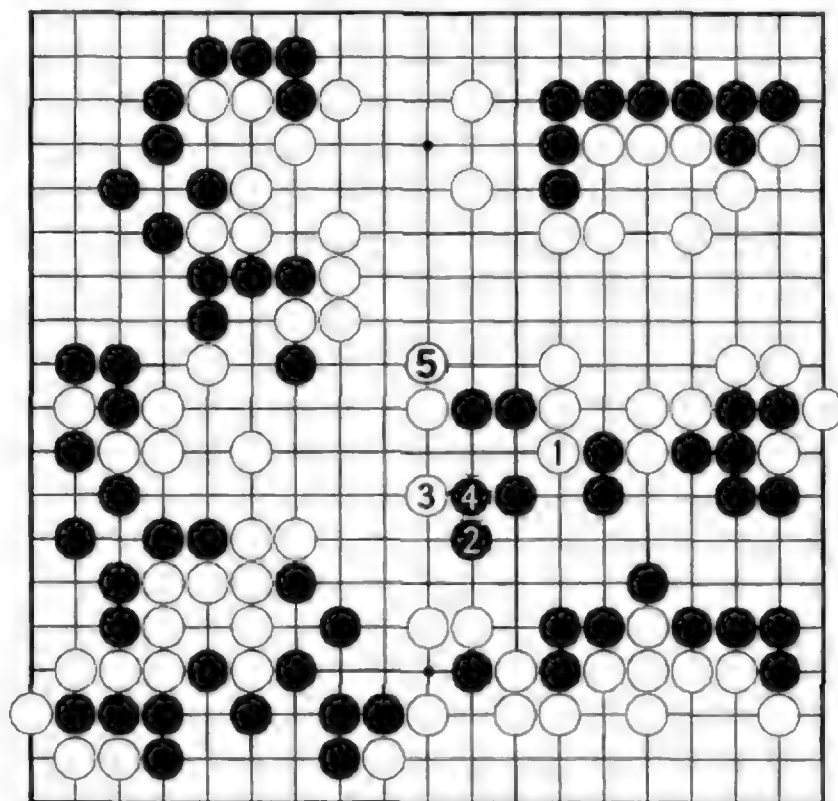


Figure 4 (101–150)

Figure 4 (101–150). The final losing move

White 18 is a good move. Usually White would answer 17 by blocking at 21, but that would give Black a peep at 20; after White connected at 19, Black would pull back at A and look forward to extending at B or peeping at C. White may lose territory at the top because of Black 19, but he makes that up with 22.

The result to 28 is reasonable for White because he cuts off 23 (Black played that move to help his connection if White pushed through below 22 after Black 27).



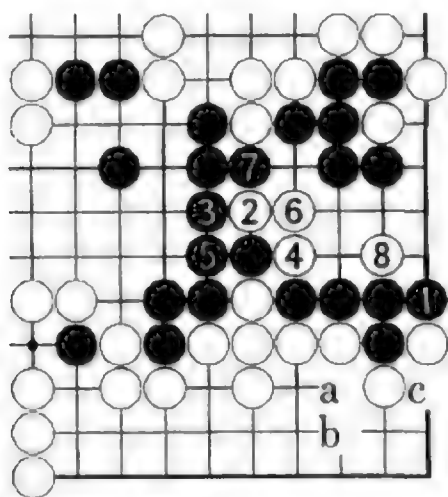
Dia. 5

White 32 is the final losing move. It's hard to know why Seo played here — whether it was a simple oversight or whether he was trying to intimidate Black. Pushing down in the usual fashion with 1 in *Dia. 5* would make the game fairly close. According to Michael's calculations, his lead would be just $1\frac{1}{2}$ points. (That may seem close considering that Black started with successes in both the bottom left and bottom right corners, but Black 29 in Figure 1 was perhaps a little slack and White also gained with his clever move at 18 in Figure 4.)

White 32 doesn't affect the diagonal connection of 2 in the diagram, so it is a loss of about half a move. Black 33 is very big: it makes the difference between $1\frac{1}{2}$ points and $8\frac{1}{2}$ points.

Black 43. Black has to be careful. If he answers immediately at 45, that is, at 1 in *Dia. 6*, White will attack at 2; after the forced

continuation to 7, White 8 captures the stones on the side. If Black has made the 'a-b' exchange, however, then capturing at 'c' will be *atari*, giving him time to link up to his stones above. On the other hand, if White plays 44 in the figure at D, he doesn't gain anything: Black will defend at 47, then later squeeze by descending at 44.



Dia. 6

White 48. If instead White E, Black connects at F; if then White G, Black links up with H — White has to have the stone at 6 in Dia. 6 to pull off anything here.

The subsequent moves do not affect the final margin.

Figure 5 (151–200)

Figure 6 (201–244)

Black wins by $8\frac{1}{2}$ points.

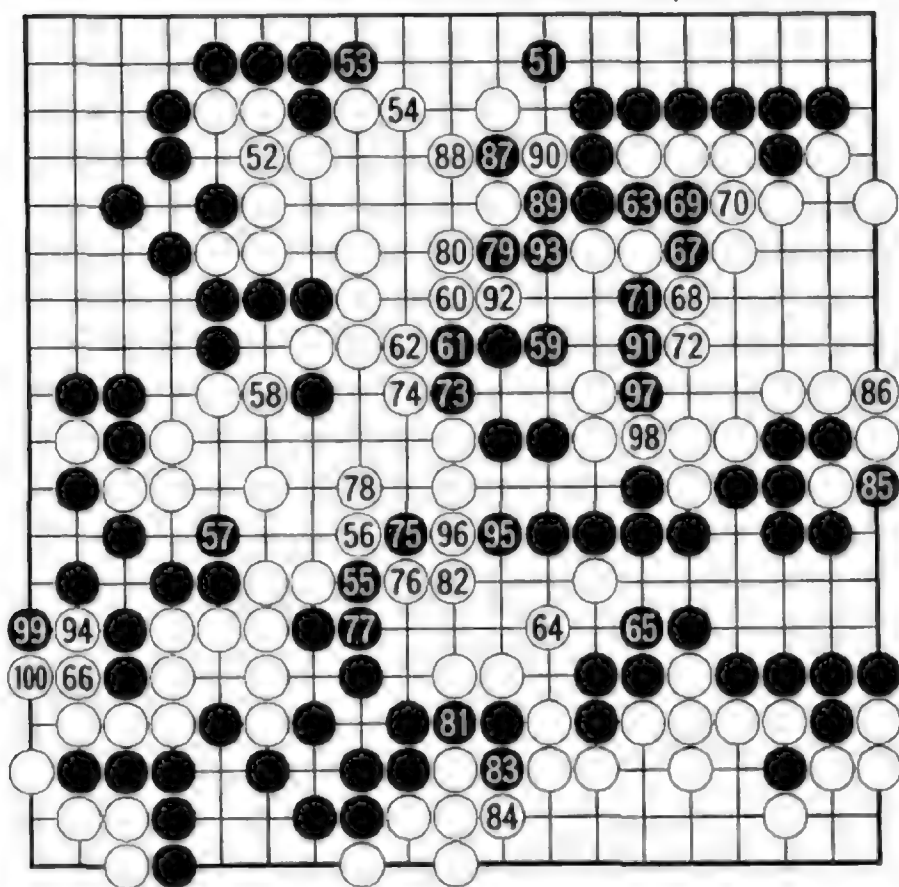


Figure 5 (151–200)

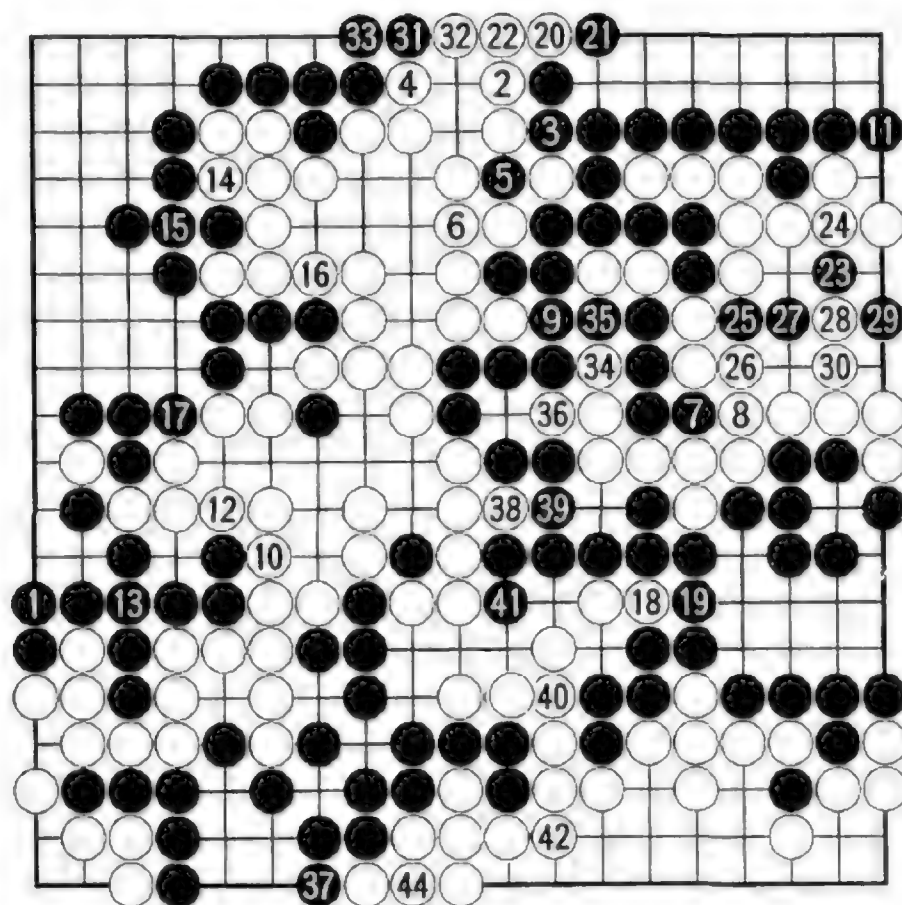


Figure 6 (201–244)

43: connects (right of 5)

Go World News

Continued from page 6

and Sakata, to have his complete games published by the Nihon Ki-in. Other publishers have put out the complete games of Go Seigen and Hashimoto Utau (both now out of print).

News from China

1994 Rating Tournament

The annual rating tournament was held in Beijing from 10 to 24 June with over 300 participants. There were three sections — high dan, low dan, and aspiring professionals — and each player played 12 games.

Two players, Zheng Hong and Liang Weitang, won promotion to 8-dan, but there were no new 9-dans or 7-dans this year.

Of the 120 players competing to join the professional ranks, eight scored the necessary eight wins and qualified.

6th Fujitsu Cup: Yang v. Takemiya

This issue features games from the 7th Fujitsu Cup, but we would first like to squeeze in one game from the 6th Cup. It is a memorable one because it marks the first appearance by a woman player in the Fujitsu Cup and also the first win. The player was Yang Hui 8-dan of China, and it was not as if she got an easy draw in the first round, for she was matched against two-time Cup winner Takemiya Masaki. However, that did not faze her. (*Ed.*)

White: Takemiya Masaki 9-dan (Japan)

Black: Yang Hui 8-dan (China)

Komi: 5½; time: 3 hours each.

Played on 3 April 1993.

Commentary by Ishii Kunio 9-dan.

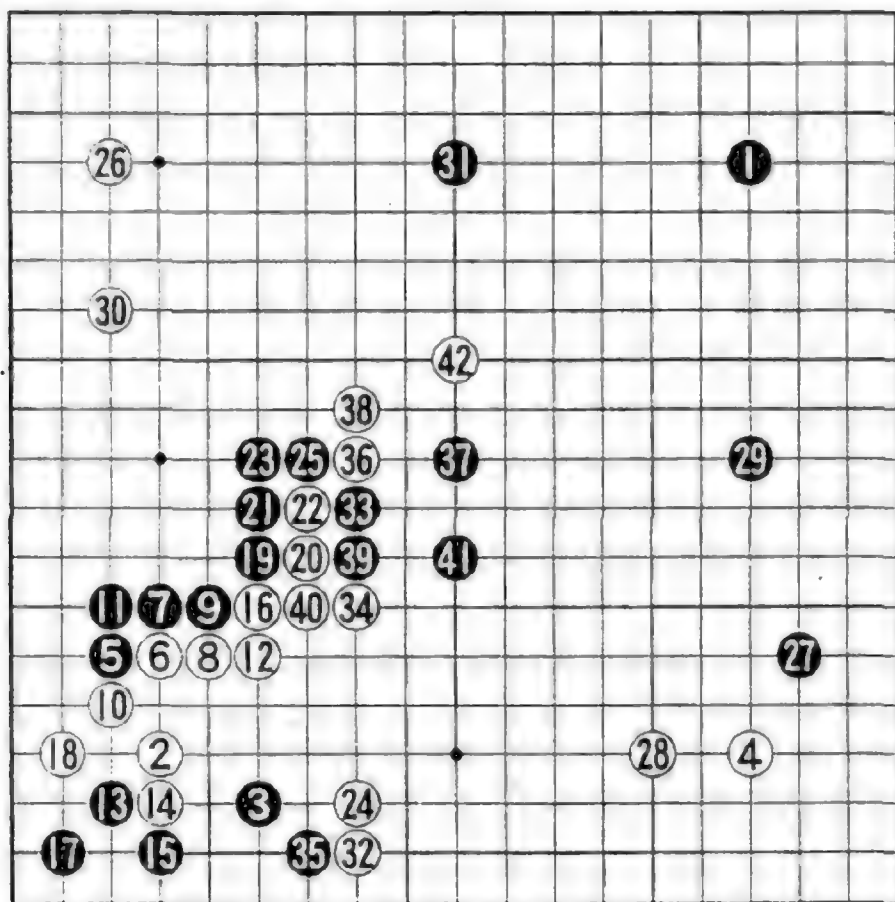


Figure 1 (1-42)

Figure 1 (1-42). Center fight

Born in Shanghai in 1963, Yang learnt go at the age of ten and made her debut playing for China at 17. In 1988 she married Cao Dayuan 9-dan, who accompanied her on this trip to Japan.

'I'm attracted by Takemiya's free, wide-open style,' Yang said before the game, 'but it's too large for me. It's like being in a maze. To keep from getting lost, I'll follow my own small, well-marked road.'

Takemiya chatted pleasantly with Yang,

as if he were trying to put her at her ease, not at all as if they were about to sit down to a serious game. Cao snapped pictures of the two talking together.

Yang drew black, and the game started with a sharp exchange in the lower left. Black 37 was a good move.

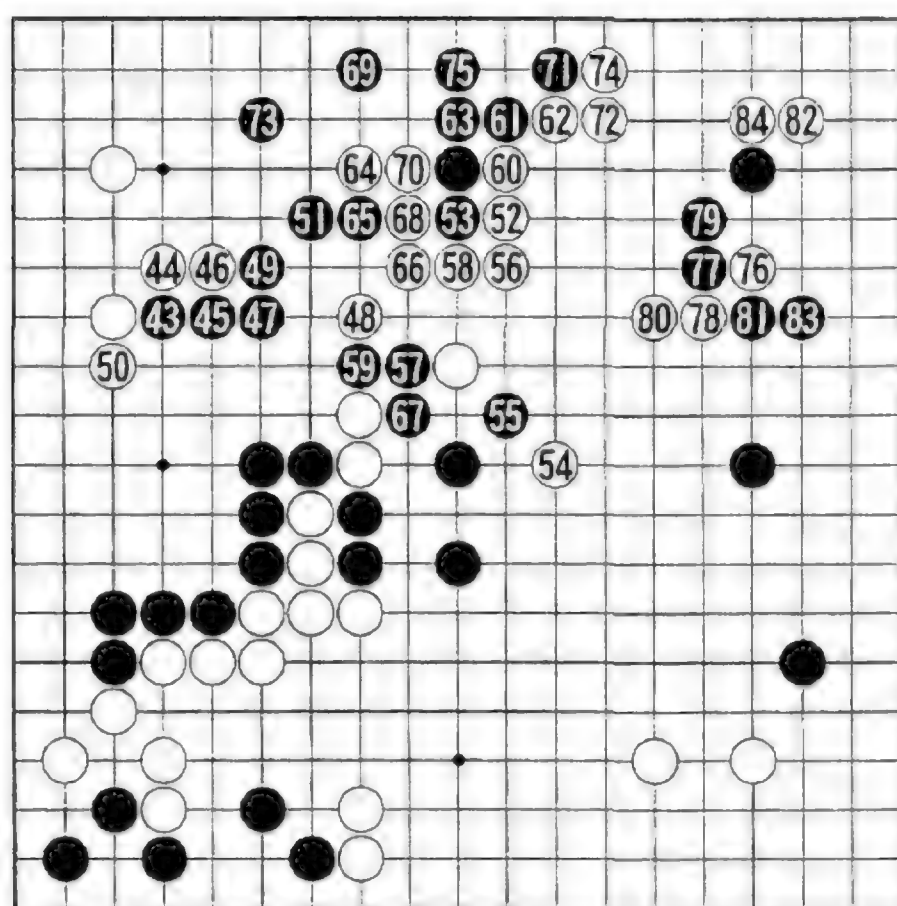
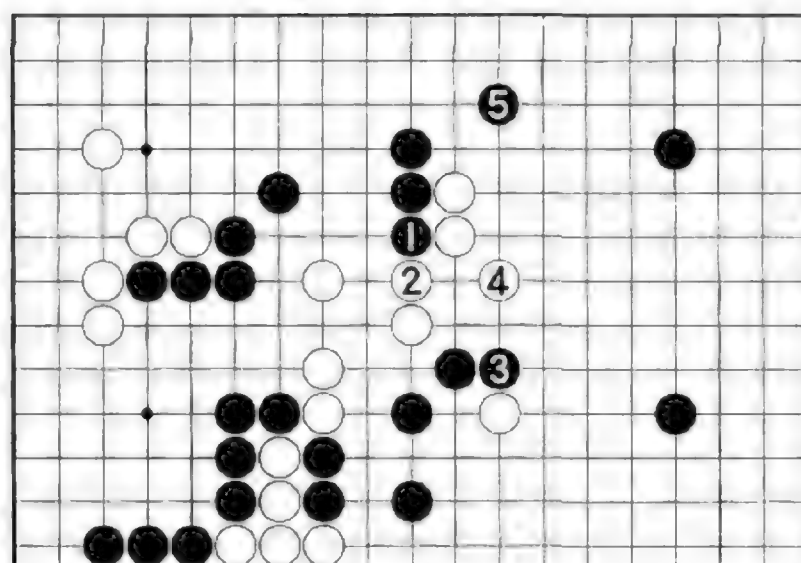


Figure 2 (43-84)



Dia. 1

Figure 2 (43-84). A clever sacrifice

Black 43 leaned hard on the left side, taking aim at White's center. 'A fine-spirited move, showing Yang's strength,' said Ishii Kunio 9-dan, 'but Black 45 should have been at 46. White 50 became an ideal point.'

White 52 was a good answer to Black 51. Having taken territorial profit with 50, Takemiya was preparing to give up some stones in the center, and Black 57 fell right

into this trap.

From 58 to 75, Black captured two of White's centre stones, but actually she was outplayed in this sequence. Instead of 57, Black should have played 1 to 5 in *Dia. 1* and attacked more leisurely.

Ishii: 'The diagram gives Black quite a good position. Black 57 changed the flow of the game.'

By the end of this figure White had the lead, but a storm was brewing.

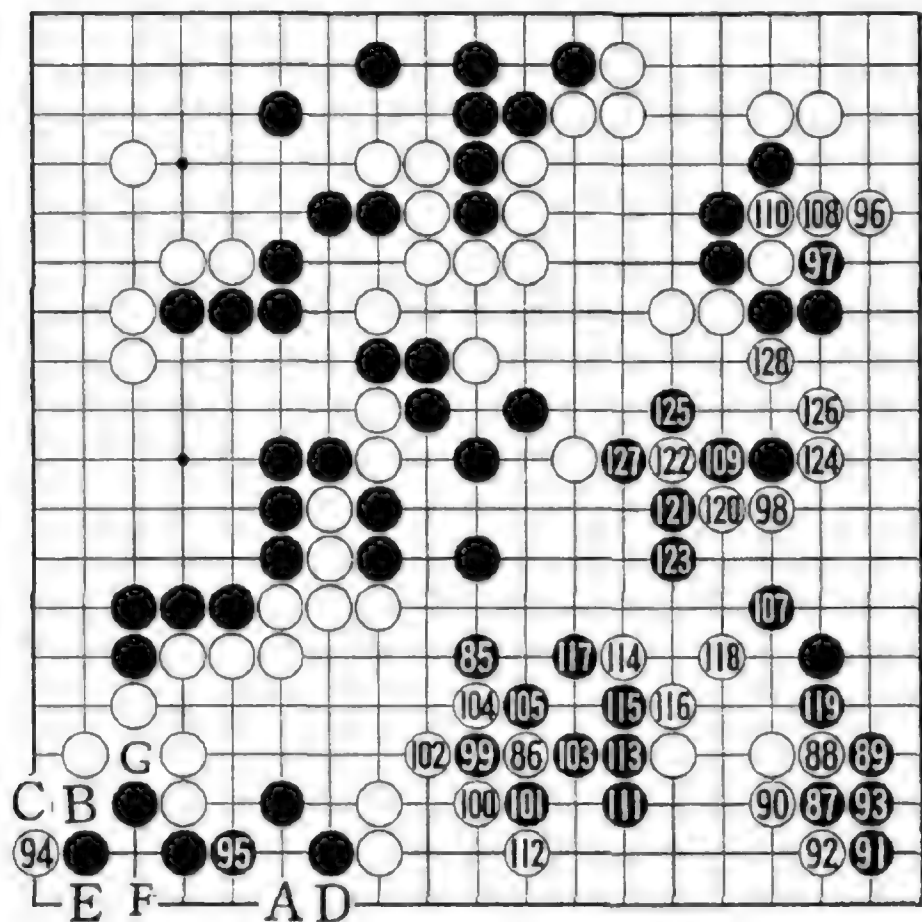
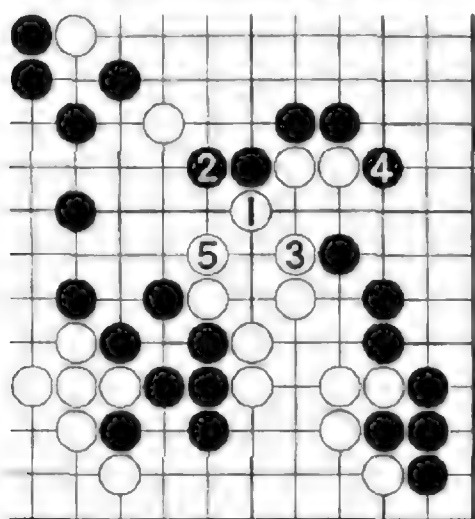


Figure 3 (85-128)
106: connects (at 99)



Dia. 2

Figure 3 (85-128). A bad exchange

The storm struck unexpectedly in the bottom right, triggered by White 94. The meaning of this move is that after Black 95 White can start a *ko* with A, Black B, White C, Black D, White E, Black F, White G, but if White loses this *ko*, his group above will be in danger, so it is not easy for him to start it. Ishii maintained that it would have been bet-

ter not to play 94.

Having played 95, Black ignored White 98 and started decisive action with 99 and 101.

Ishii: 'White 102 to Black 107 are reasonable, but White should have played 108 at 109, followed by Black 124 and White 113, to link up.'

White naturally answered Black 109 by taking three stones with 110, and Black 111 attacked the bottom right. After 112 to 121, White could have kept the lead by living as in *Dia. 2*, but for some reason Takemiya played 122. No matter what angle you view it from, the *furikawari* or exchange through 128 was bad for White. His lead was now in doubt.

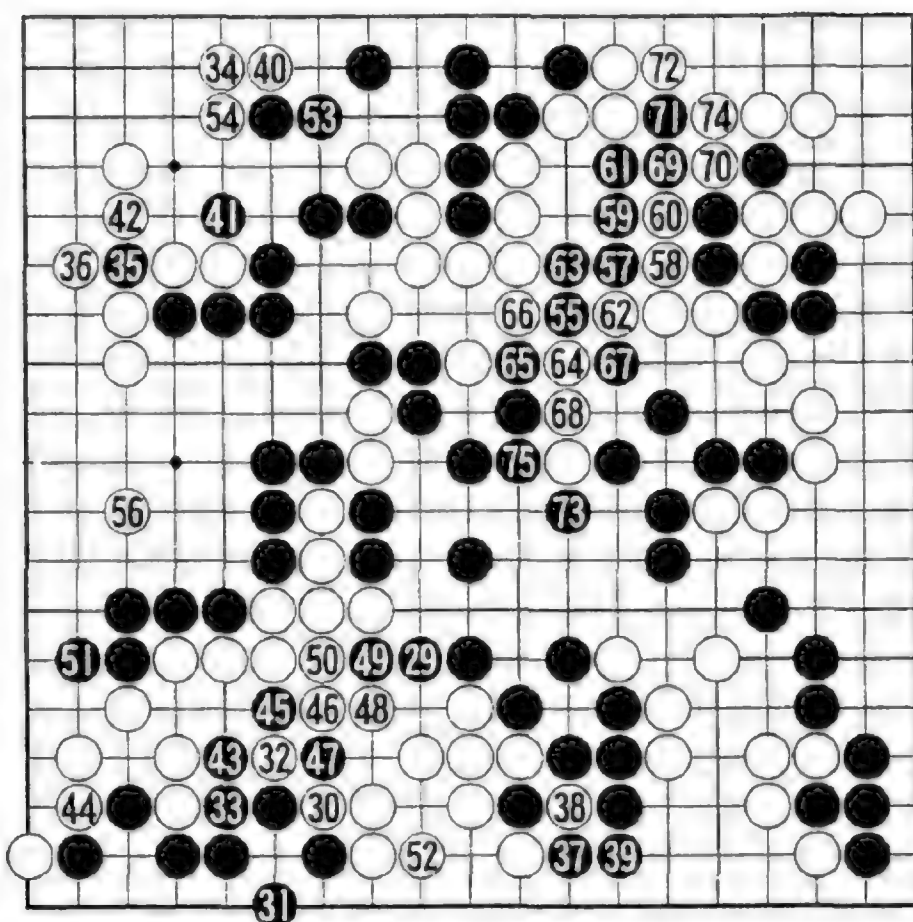
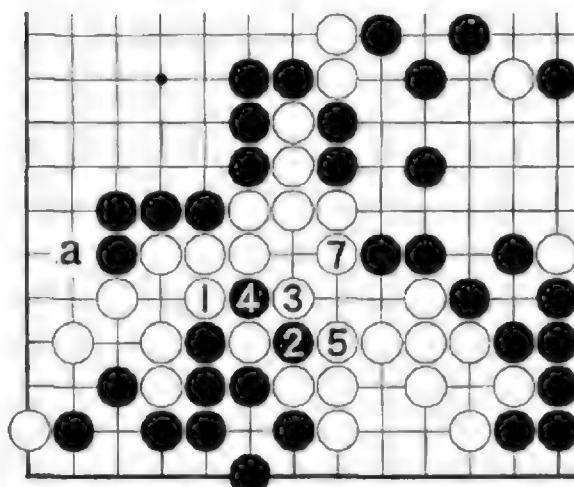


Figure 4 (129-175)



Dia. 3
6: connects

Figure 4 (129-175). Upset

Her fortunes fast improving, Black played 29, forcing White 30, then lived with

31, eliminating the *ko* mentioned earlier. White 34 was a big point, but Black 37 was also big and eliminated further potential trouble. 'At this point I thought I was back in the game,' Yang said afterward.

Actually White was still slightly ahead, until he played 44. Ishii called this the game-losing move. White should have played 1 to 7 in *Dia. 3*. Then Black A would not have been *sente*. Black 45 to 51 in the game forced White into a miserable life with 52.

Ishii: 'White's being kicked around and trampled upon. Takemiya must have gotten overconfident.'

The lead had changed hands.

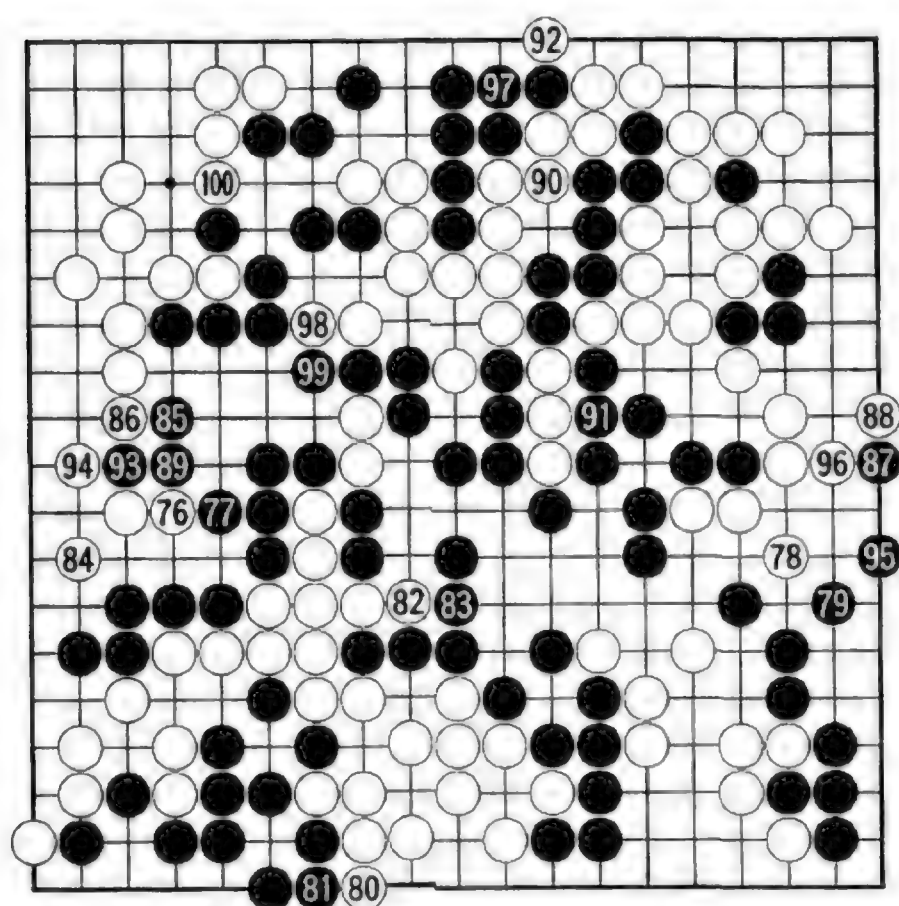


Figure 5 (176-200)

Figure 5, Figure 6

'I think the reason I won is that I just looked at the board and played my best, without watching Takemiya,' said Yang. She was smiling happily. As the first woman contestant in the Fujitsu Cup, she had played in earnest, broken out of a difficult position, and defeated a strong opponent.

'Yang is a tough opponent,' said her husband Cao, who also looked happy. 'Takemiya seems to have slipped up through over-optimism.'

Although 45 in Figure 6 was the last move of the endgame, as the players were alternately filling the neutral points, Takemiya failed to connect at A and Black cut, causing more excitement. Since the tourna-

ment was conducted under Japanese rules and both players knew the score, they agreed to let White connect at A and counted the territories, confirming Black's victory.

Black wins by $\frac{1}{2}$ point.

(Translated from the Yomiuri by James Davies)

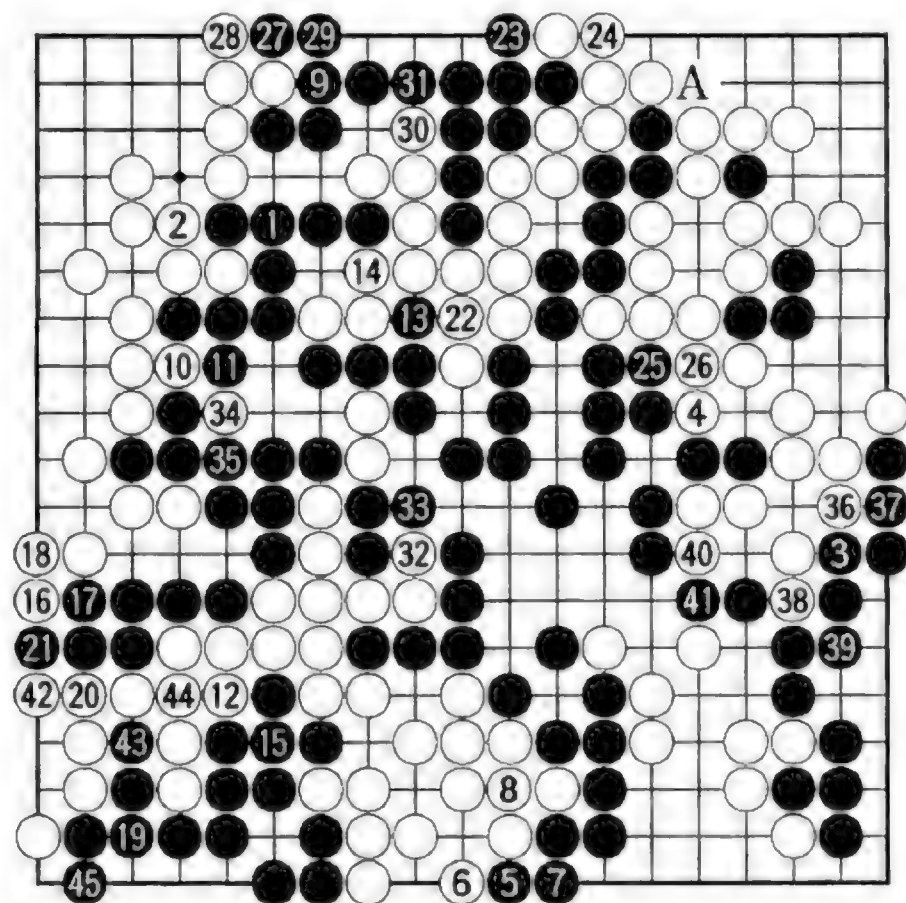


Figure 6 (201-245)



7th Fujitsu Cup



The start of the game — is Shuko meditating or snoozing?

This year's Fujitsu Cup has ended with Korea's second win in a row (see the news section). In this issue, we would like to present some of the most interesting encounters from the early rounds.

The game that attracted most attention in the first round was the one pitting the oldest player in the tournament against the youngest. It was the first game ever between the 68-year-old Shuko and the 18-year-old Lee. That's not surprising because this was only Shuko's second appearance in the Fujitsu Cup (he also played in the 5th Cup; he lost in the first round). Lee, who at the time held 12 Korean titles, was making his fifth appearance. However, he didn't compete last year. At the time it was said that he was too busy with Korean title matches, but there were rumours that he sat the tournament out because he had never done well in games played in Japan (his score so far was three wins to seven losses; his best result was reaching the semifinals of the 3rd Cup). Lee's comment at the reception seemed to confirm the rumour. 'Last year I didn't have confidence, so I didn't play. This year I'm confident I'll win.'

Round 1: Shuko v. Lee

White: Lee Chang-ho 6-dan (Korea)

Black: Fujisawa Shuko 9-dan (Japan)

Komi: 5½; time: 3 hours each

Played on 2 April 1994.

Commentary by Kato Masao.

Figure 1 (1–40). *A reasonable start*

When White sets out to reduce the *moyo* with 16, answering at A is not inviting — White jumps down at B and can't be stopped.

The result to 32 is reasonable for both, according to Kato.

Black 33. The reason for playing this move, presumably, is that Black is worried that if he simply plays at 35, White will take *sente* with White C–Black D, then switch to White E.

Black 37. The reaction of the players in the pressroom, starting with Kato and Takemiya, was 'Shuko Sensei is playing too tightly'. They advocated playing 37 at 39; if White answered at 38, Black could jump to F next, enclosing the left side more efficiently than in the game.

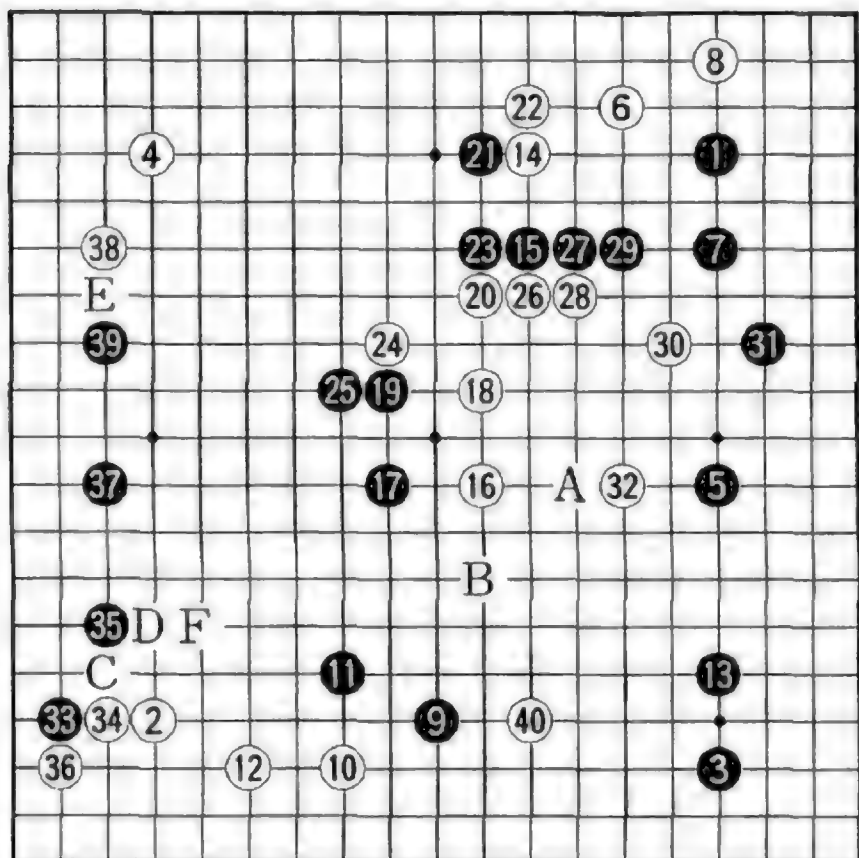


Figure 1 (1-40)

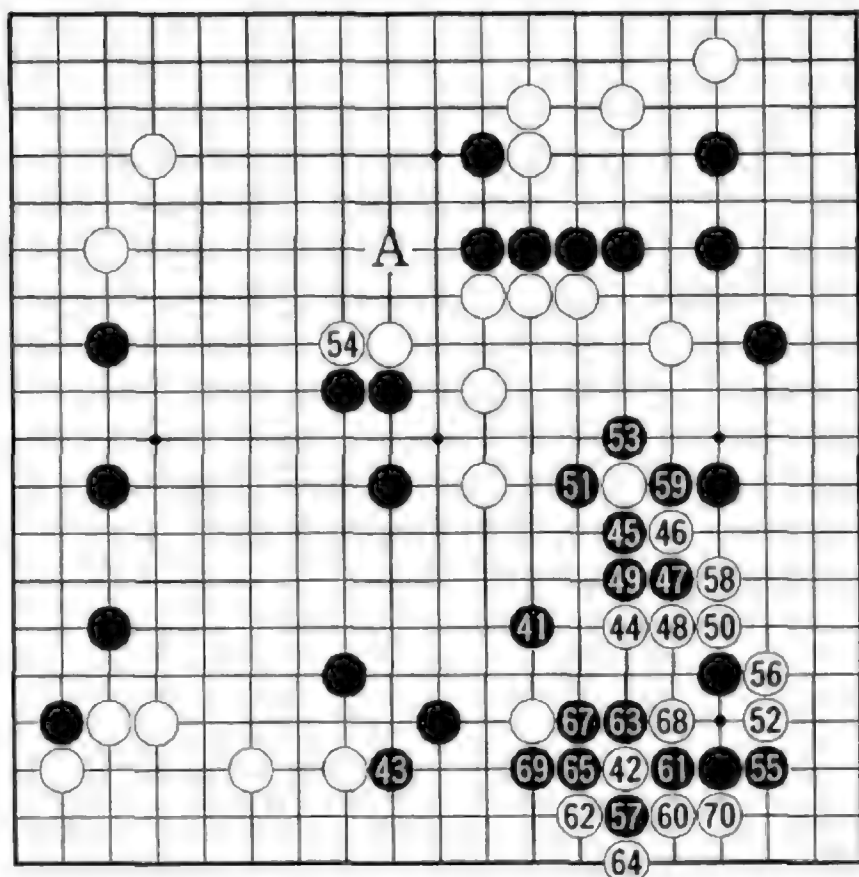


Figure 2 (41-70)

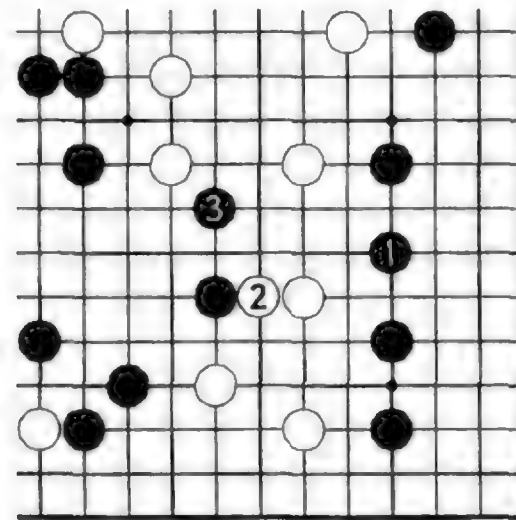
66: connects

Figure 2 (41-70). Too impatient

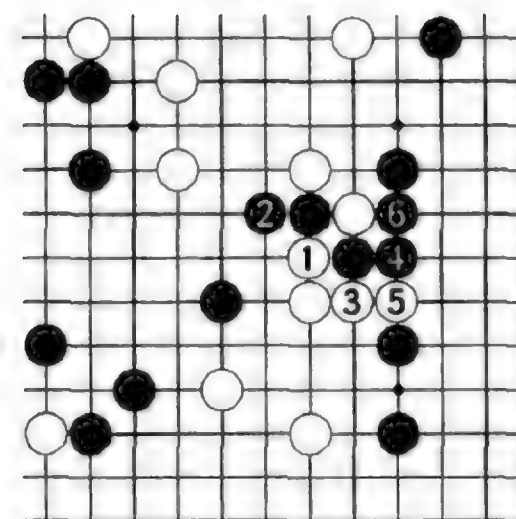
Black 41. Capping here leads to a sharp fight. Black 42 is also conceivable.

Black 45, 47. This interception is unreasonable. Black should play more patiently, defending at 1 in *Dia. 1*; if White 2, Black 3. Black secures about 30 points on the right side and has a reasonable game.

White 48 is a calm move — perhaps overlooked by Shuko. Kato: 'Simply pushing along at 48 is good style. It puts Black on the spot.' The upshot is that Black's corner enclosure dies.



Dia. 1



Dia. 2

The temptation for White with 48 is to cut first with 1 in *Dia. 2*, but the result to 6 is much better for Black than that in the game.

Black has to make up for his loss on the bottom right by attacking in the centre, which he does with 51 and 53. Actually, he would like to play 53 at A, but White would extend at 53 and would probably be able to get eye shape.

Black 57. Black could live by playing at 60, but this would be too submissive.

White 68. White could have gained about ten points — and put Black close to collapse — by playing at 69.

Figure 3 (71-100). Immune to attack

White 76 completes the capture of the corner. A potential black area of 30 points has been transformed into a white area of 20 points.

Black 77. Black returns to his centre attack. His aim is, after 78, to wedge in at 1 in *Dia. 3*, setting up the cut to 7. At present, however, with the gap at 'a', this is unreasonable, so he attacks at 79 as preparation.

Resisting strongly would be risky, so Lee calmly sacrifices two stones, then forestalls the attack with 86. This move makes excellent shape in itself and also sets up a sharp

follow-up at 92. That contact play decides the game.

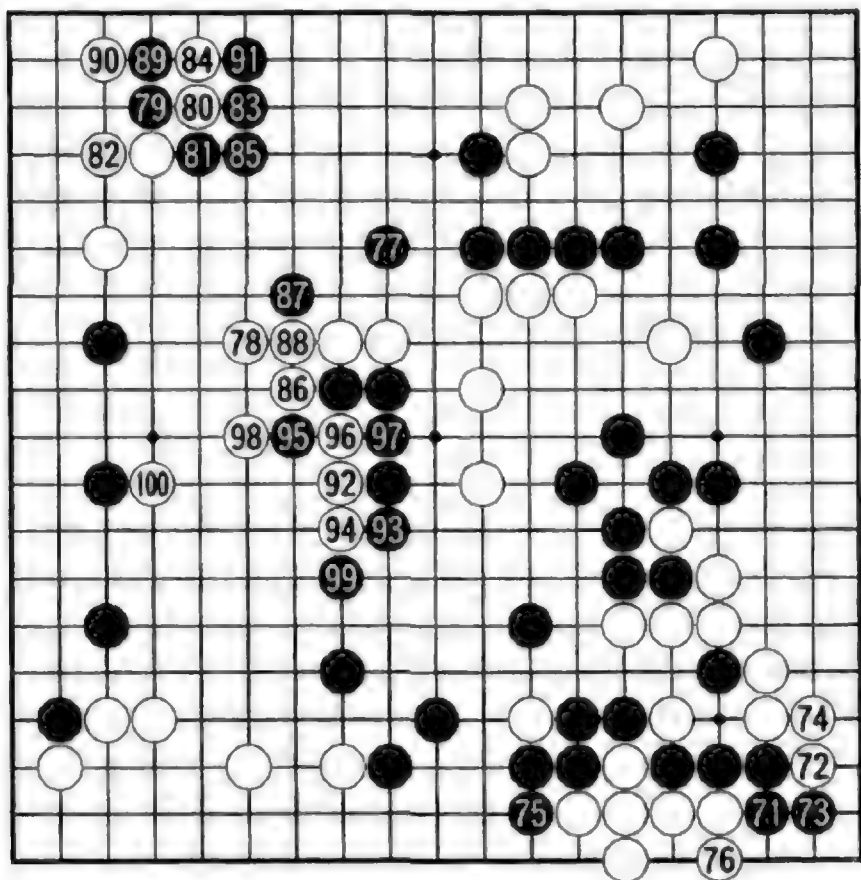
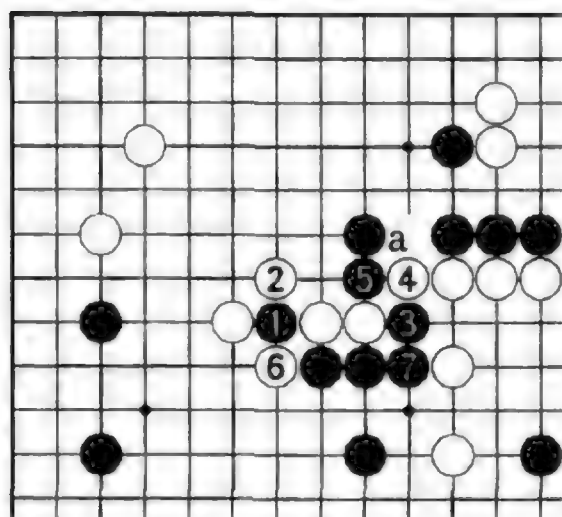


Figure 3 (71-100)



Dia. 3

Lee: 'Wouldn't the game still have been close if Black has used 91 to play at 92? I didn't feel that I was ahead.' Perhaps he was being diplomatic — White had a good lead.

White 98 secures White's only weak group. If Black tries to escape with 1 in *Dia. 4*, White sets up a *geta*. If Black plays 3 at 4, White 3 is good for White.

Figure 4 (101-150)

White 2 is a sacrifice to take *sente*. White 6 makes White's lead clear.

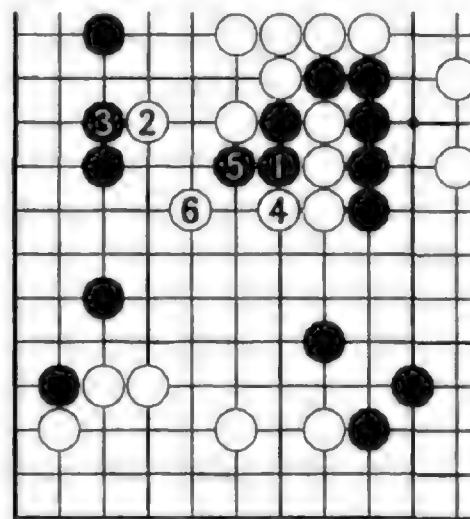
Figure 5 (151-176)

In summing up this game, Kato expressed puzzlement as to why Shuko was in such a hurry to attack with 45 and 47 in Figure 1. The game wasn't bad for him, but this overplay only gave his opponent a chance to

pull off something. This impatience was uncharacteristic.

When he resigned, Black was seven or eight points behind on the board.

Black resigns after White 176.



Dia. 4

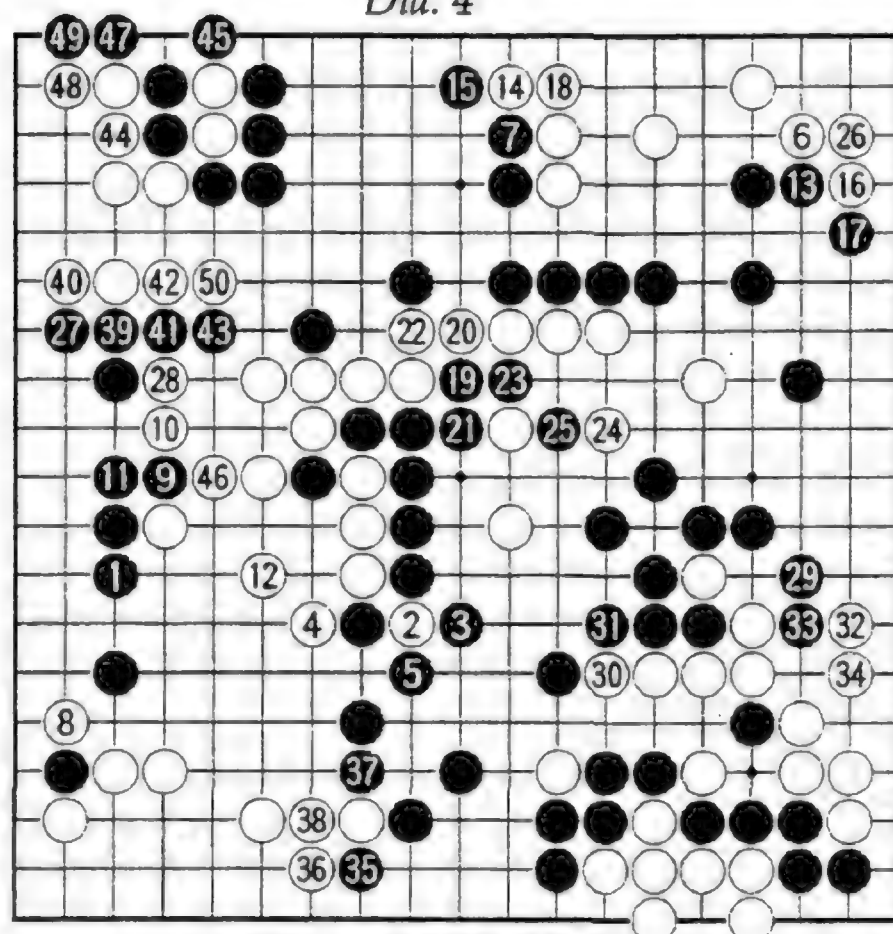


Figure 4 (101-150)

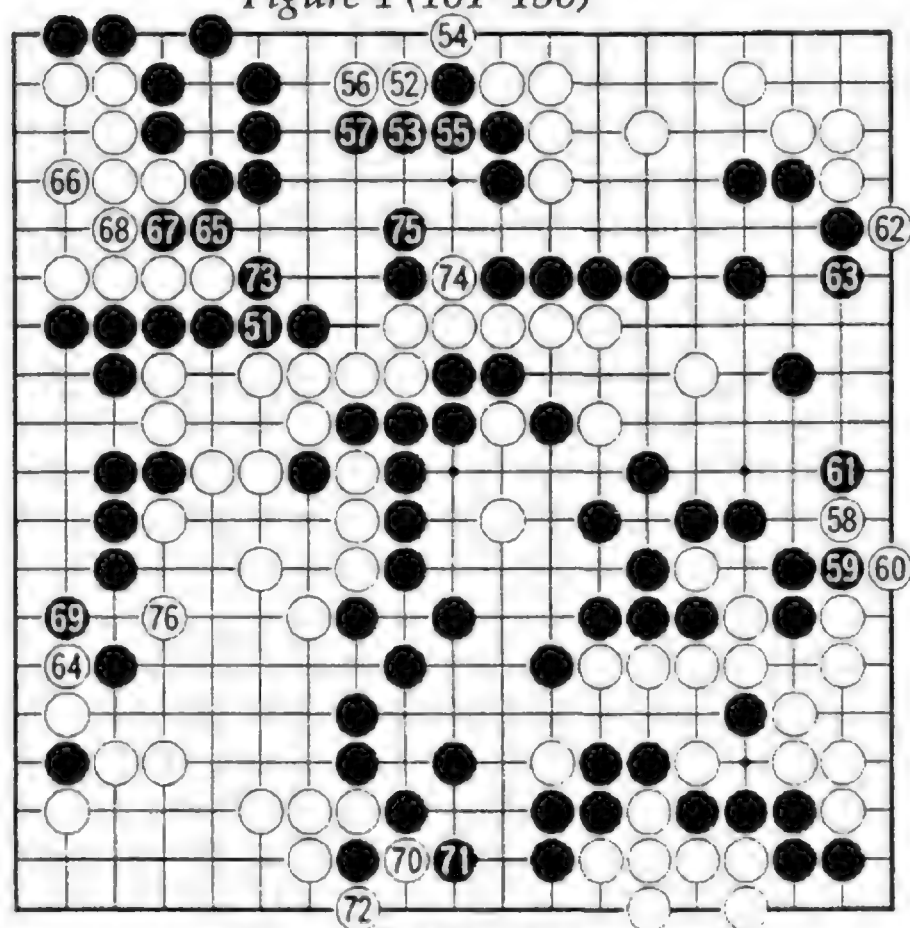


Figure 5 (151-176)

Round 2: Kato v. Lee

Lee's game in the second round was even more deserving of attention: it featured some spectacular trades that show just how unpredictable professional go is. As Takemiya said in his public commentary, 'This is a good game — it feels good.'

Kato has been enjoying great form this year; his record before this game was 8–1, and by the end of April he had taken that to 13–1. Lee was doing even better, of course, with 12 titles to his name.

White: Kato Masao 9-dan (Japan)

Black: Lee Chang-ho 6-dan (Korea)

Played on 4 April 1994.

Commentary by Kato Masao.

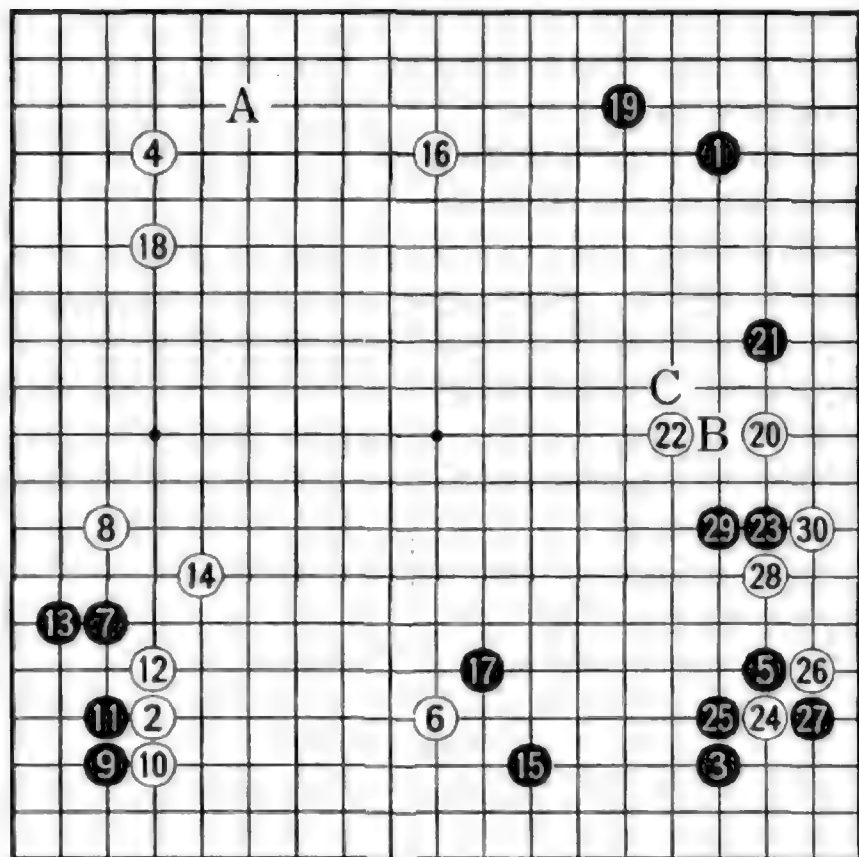


Figure 1 (1–30)

Figure 1 (1–30). Too territorial

The opening to 14 is a common *fuseki* pattern. However, Black 15 is unusual. Kato: 'This move, which aims at pressing at 17, has begun to be played recently, but I still think that making an approach move at A or extending to 16 is bigger.'

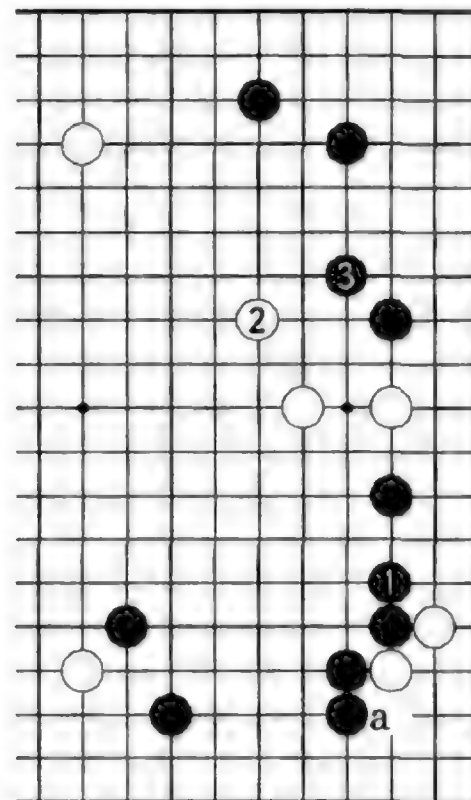
Black 19. Takemiya and Kato both thought that Black B was bigger. That would work well with 17.

White 22 is worth noting. Extending to 28 might seem natural, but this two-space extension would be cramped for space and Black C next would become a good move.

White 24 is a high-level move: his aim is to settle his stones on the right side.

Black 27. Lee chose to secure the corner profit, but Otake commented that White would probably have found 1 in *Dia. 1* more disagreeable. This move avoids helping White get *sabaki*. White may be left with a *ko* for life after 'a', but at this stage that's not a significant problem.

White 28 is a *tesuji*. Black can't resist, so White settles himself while destroying black territory up to 38 in Figure 2.



Dia. 1

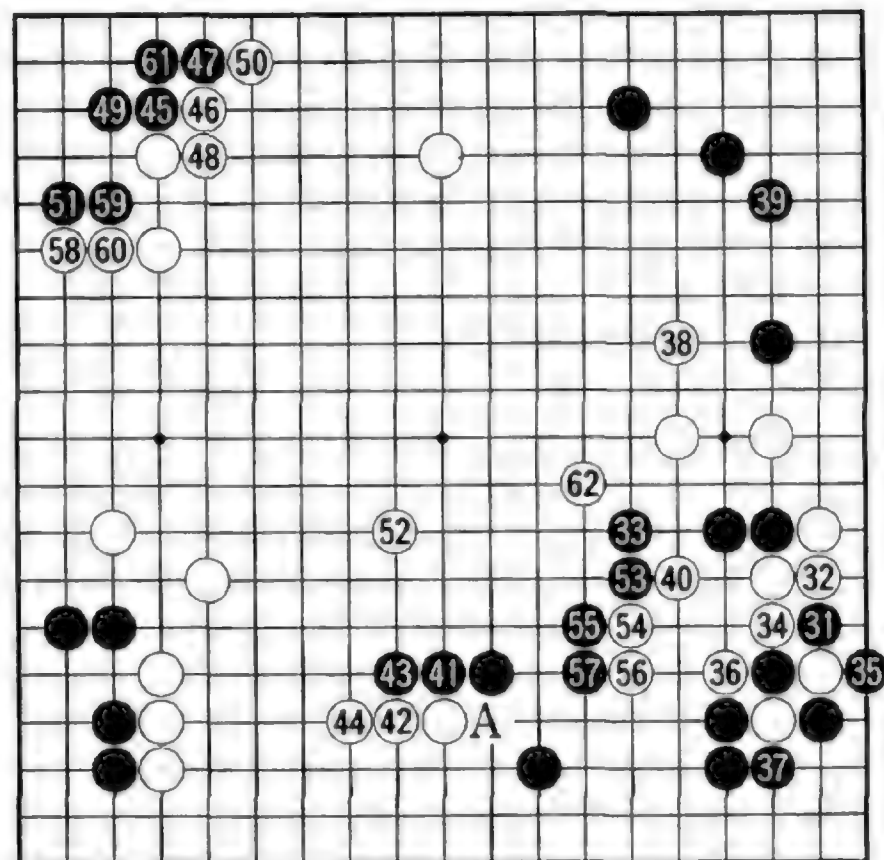


Figure 2 (31–62)

Figure 2 (31–62). Corners v. the centre

Kato was probably pleased with this result, but he had second thoughts about 42.

'This was heavy. Defending the top left corner with 46 is bigger.'

White 52 aims at pushing along at A and cutting, so Black reinforces with 53 to 57.

Up to 61, Black secures all four corners but has decent territory in only two of them.

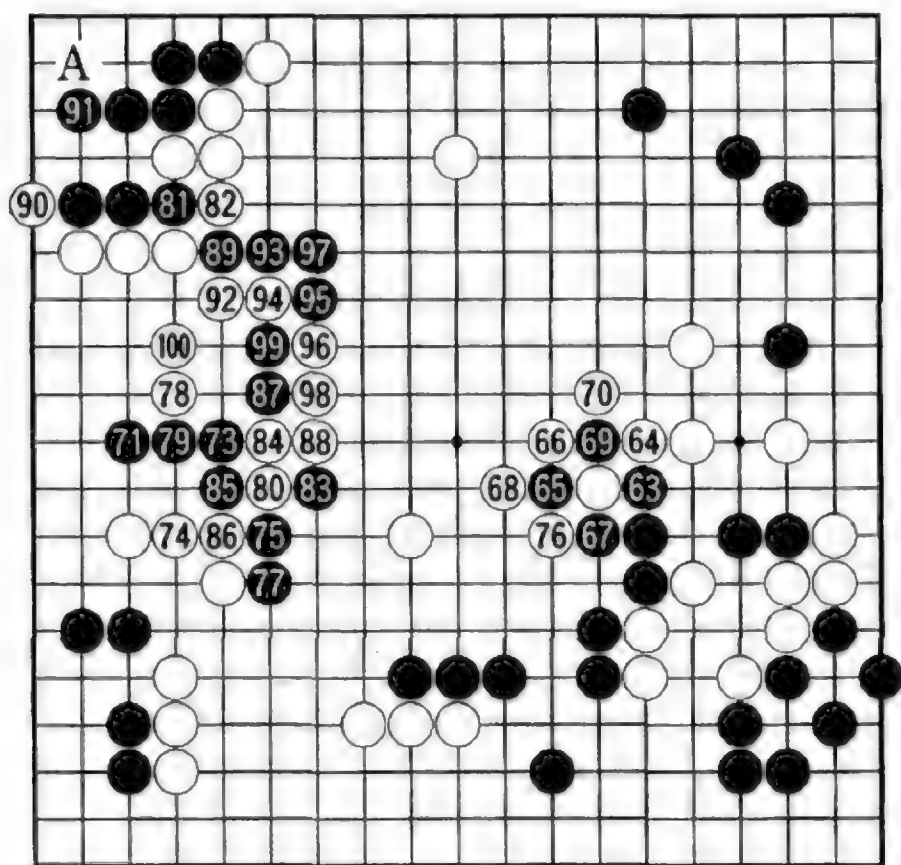
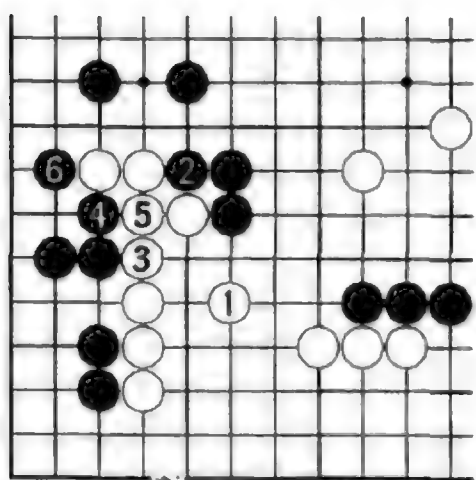


Figure 3 (63-100)

72: ko



Dia. 2

Figure 3 (63-100). *A surprise for Lee*

The aim of 71 is to prepare *ko* threats for the *ko* fight in the centre, but Kato finishes off the *ko* immediately with 72 and 76. This looks bad for Black locally, but Lee probably calculated that destroying White's left side would make up for the *ponnukis*. However, he didn't bargain on White's forceful attack at 80. After 77, he had expected White 1 in Dia. 2; that lets Black link up with 2 to 6.

The premise for White 80 is a favourable ladder, of course. Black plays 81 to create the cutting point at 89, then hanes at 83. White now has cause to regret not having ex-

changed White 90 for Black A earlier, as that would help him in the later fighting.

Black 91. Black A is the shape move, but with a fight having started on the outside Black answers more aggressively with 91. This gains him two moves if a *semeai* (capturing race) starts.

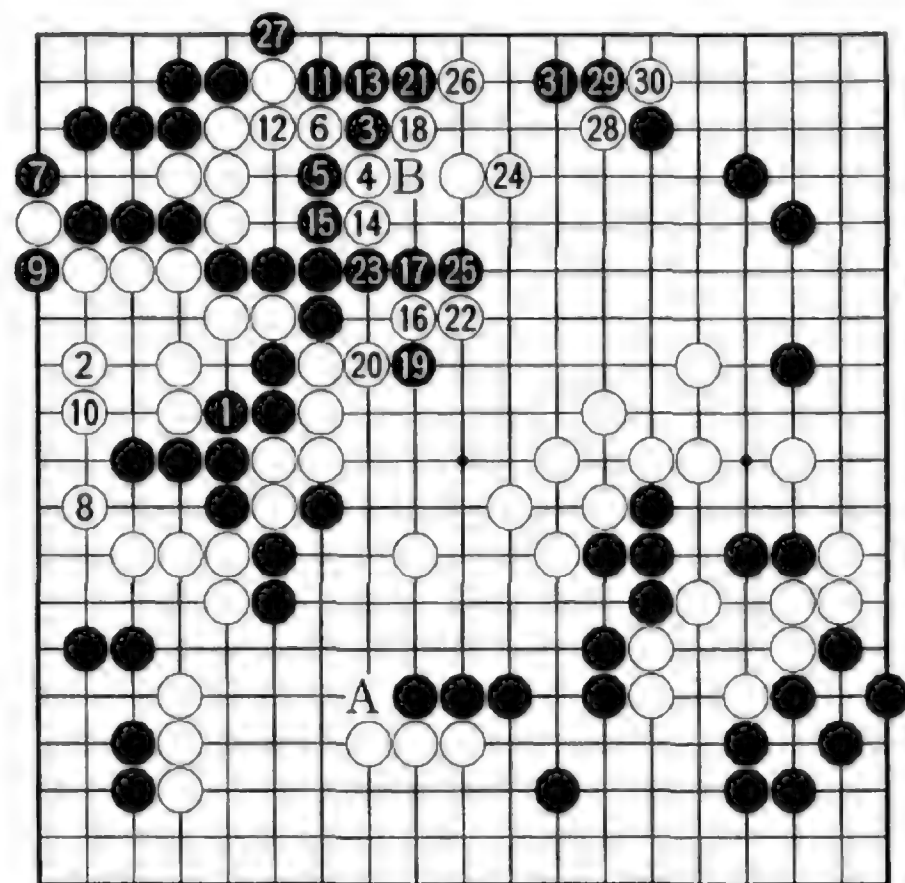
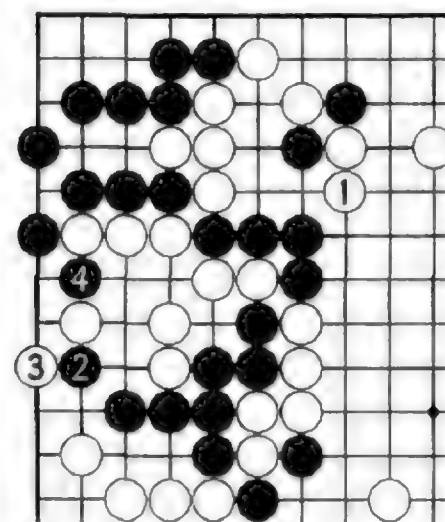


Figure 4 (101-131)



Dia. 3

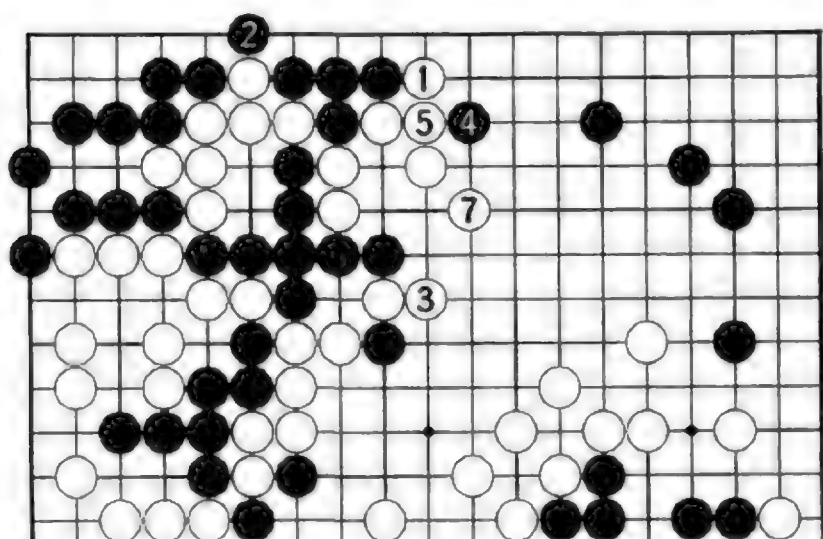
Figure 4 (101-131). *Kato's mistake in timing*

White 10 secured the capture of the seven black stones, but Kato was not happy when Black switched to 11. 'I thought the game was bad for me,' he said. White's top position does look like being cut to pieces. At the time he regretted playing 10, but research after the game showed that it was after all necessary. If omitted, White's group will be in danger after Black 2 and 4 in Dia. 3.

On the other hand, Lee thought that losing the seven stones put him behind, but then he is usually a pessimist in evaluating positions.

With 15 Black catches the seven white stones, which cancels out his own loss.

White 22. Kato: 'I should have blocked immediately at 26.' That gives *Dia. 4*. Black 2 is forced, so White can link up with 3 to 7. Black will then switch to A in the figure.

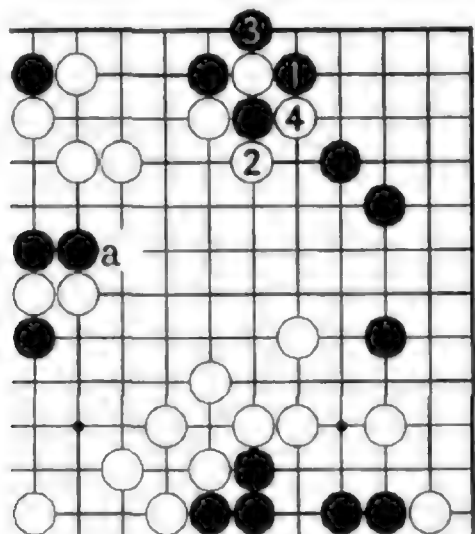


Dia. 4

In the game, Black connects at 23, which White has no choice but to answer at 24, so Black gets to make the severe move of 25. Note that if White plays 24 at 26, Black throws in at B and captures the group. At this point, the game does seem to be tough for White.

White plays 28 to seek *sabaki*, and Lee helps him out with an unbelievable answer at 31. He must have made a reading mistake. Or perhaps he was too pessimistic about his position and thought he had to go all out . . . At any rate, one rarely sees him slip up like this. Instead of 31 —

Dia. 5. Black should calmly capture at 1. White will play 2 and 4; Black connects and White will have to add a move, perhaps at 'a', to secure his connection. This is the best that White can expect. Black secures a corner territory of about 20 points.



Dia. 5
5: connects

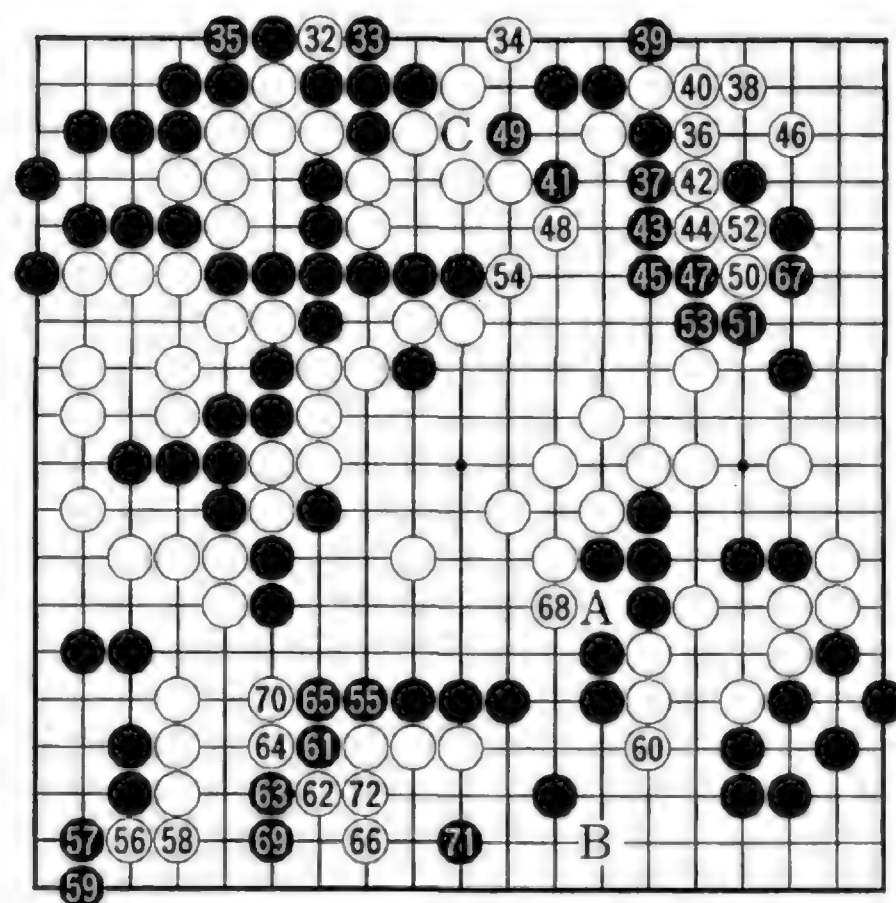


Figure 5 (132-172)

Figure 5 (132-172). An eventful game

Kato seizes his chance, and in an instant the corner is transformed into white territory. On top of that, he makes shape in the centre with 54.

Black 61 and 63 are a makeshift so that he can take the large point of 67, but White 68 is the finishing blow. Black has to resign after 72 — if he connects at A, White will attack at B; the black group can live, but White will keep *sente* to switch to C, going one or two points ahead on the board.

This was an eventful game, with Kato taking the lead first, Lee upsetting it, then Kato upsetting it again.

Black resigns after White 172.

Round 2: Hua v. Otake

White: Otake Hideo 9-dan (Japan)

Black: Hua Xueming 7-dan (China)

Played on 4 April 1994.

Commentary by O Rissei 9-dan.

Hua Xueming, born in Shanghai on 17 November 1962, is one of the top women players in China. She became a professional in 1986, when she was 6-dan, and earned promotion to 7-dan in 1993. In 1989 she came second in the All-China Individual Championship.



Otake Hideo

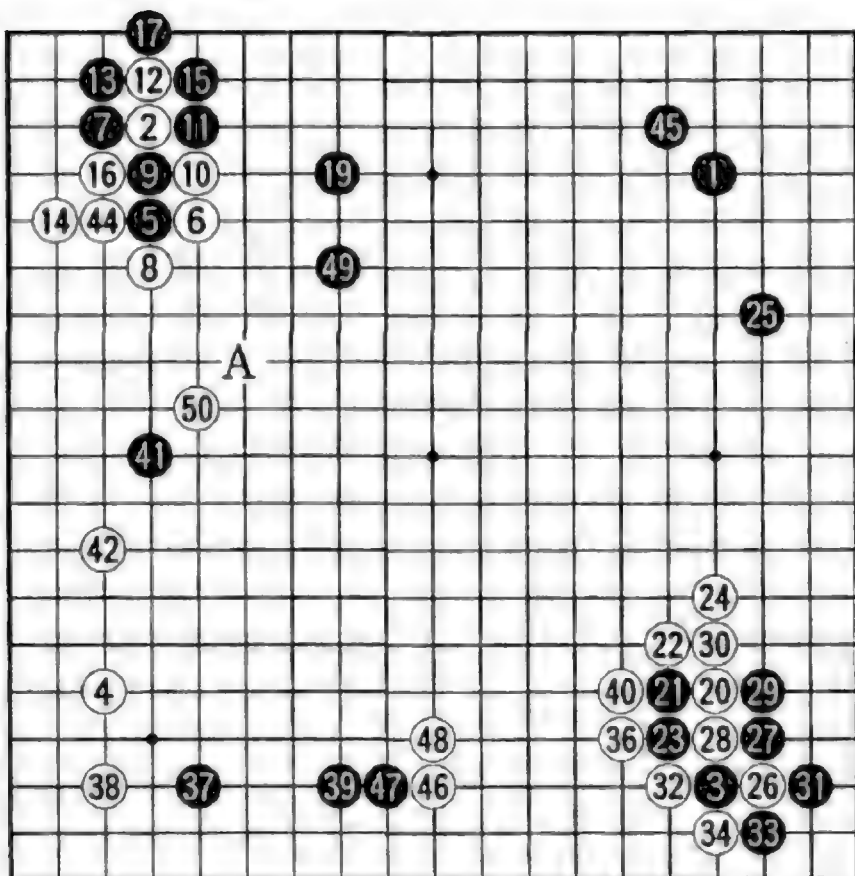


Figure 1 (1-50)

18: at 2; 35: connects; 43: at 12

Figure 1 (1-50). Good timing

White 6. 'The first time I've seen Otake play this,' commented O.

Black follows suit with 21, but a different *joseki* follows.

Black 25 makes it easy for White to attach at 26. The reason is that after the *joseki* to 36, 25 is aiming at an area where White is open

at the side (that is, above 29). Black 25 therefore becomes a little slack.

Black 41 is a well-timed forcing move. If Black plays 41 at 45, White will make good shape on the left side with White 41.

Black 47 is pragmatic. Black doesn't really like the exchange for 48, but she needs to reinforce her position here, as there's a possibility that 37-39 and 41 will be subjected to a double attack.

White 50 may be dubious, according to O, as it gives Black the 51-55 combination in Figure 2 to seek *sabaki*. To avoid that, he suggested playing 50 at A.

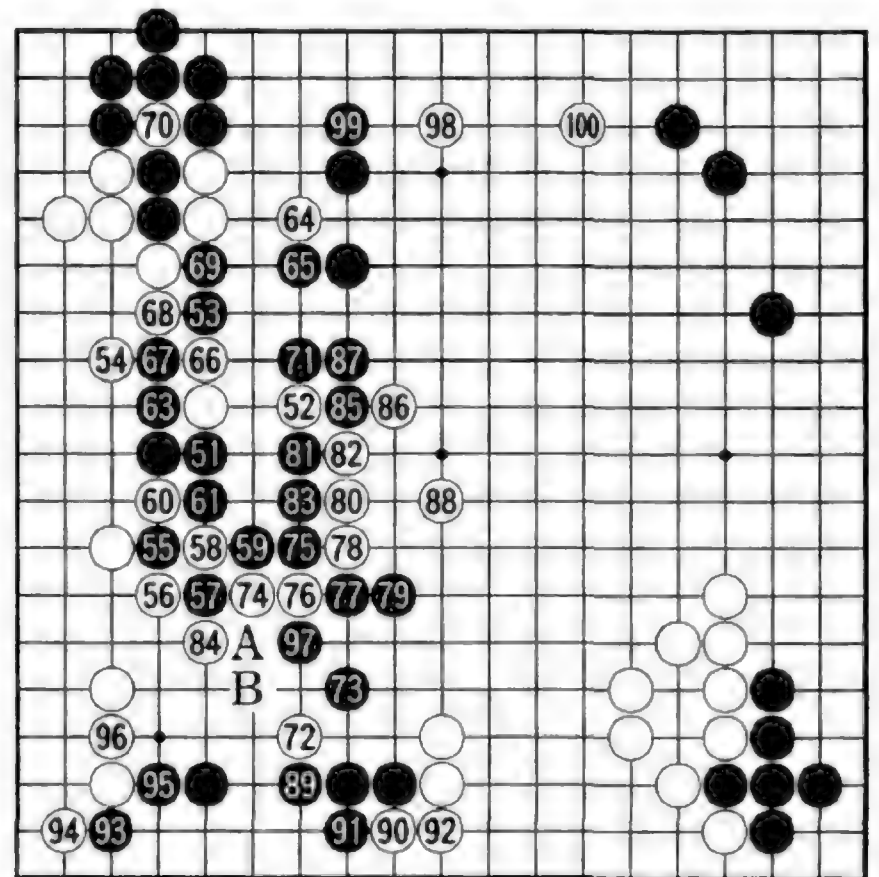


Figure 2 (51-100)

62: connects

Figure 2 (51-100). Hua shows her strength.

Black 63 is forceful. Around here Otake started muttering 'Ouch' and 'I'm in trouble' to himself.

White 84 is forced — White would like to play in the centre, but Black 84 would capture 74 and 76. When Black captures with 85, she has the initiative.

After 97 the black group is almost secure; it can get a second eye with Black A and Black B. If White can't put pressure on this group, then he has to pull off something at the top.

Figure 3 (101-130). No compromise

Black 1 is very aggressive. The conventional strategy would be to cap at 2 and look

for a chance in the ensuing fight to switch to A. That would be good enough, but Hua is not satisfied; Black 1 shows that she is trying to capture White.

Black 19. 'An impressive move,' said O. One's first instinct is to play Black B, but then White C would become *sente*, so White would be able to make eye shape here. Black 19 shows how determined Hua is to maintain her attack on the centre group.

Black 29 is another severe move. Hua is showing her strength.

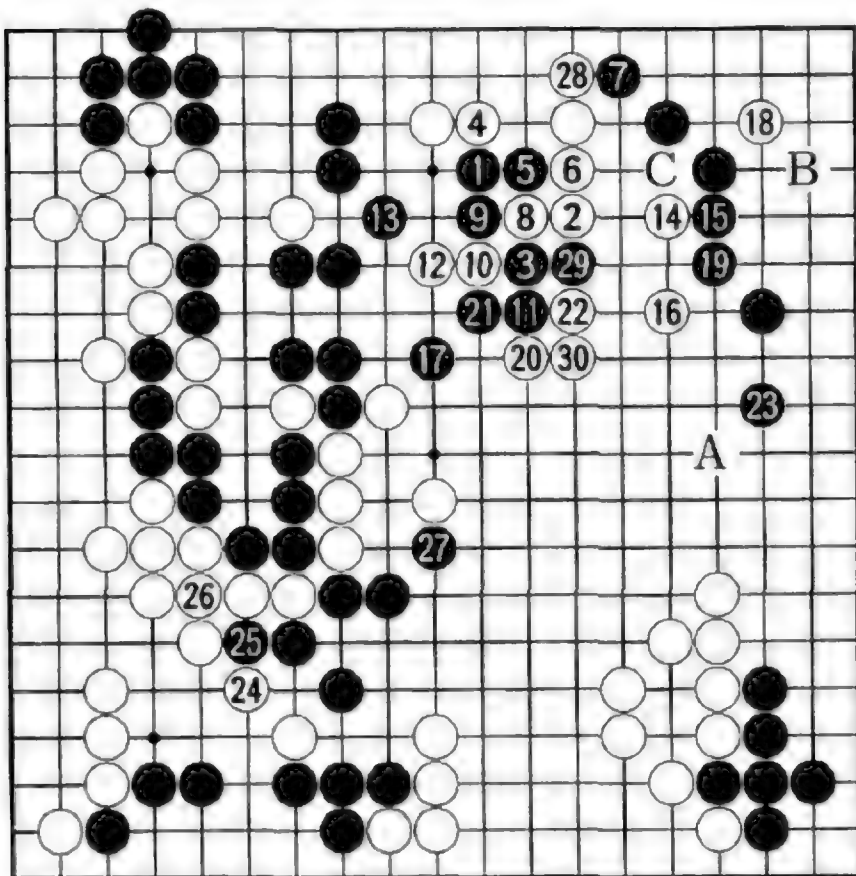


Figure 3 (101-130)

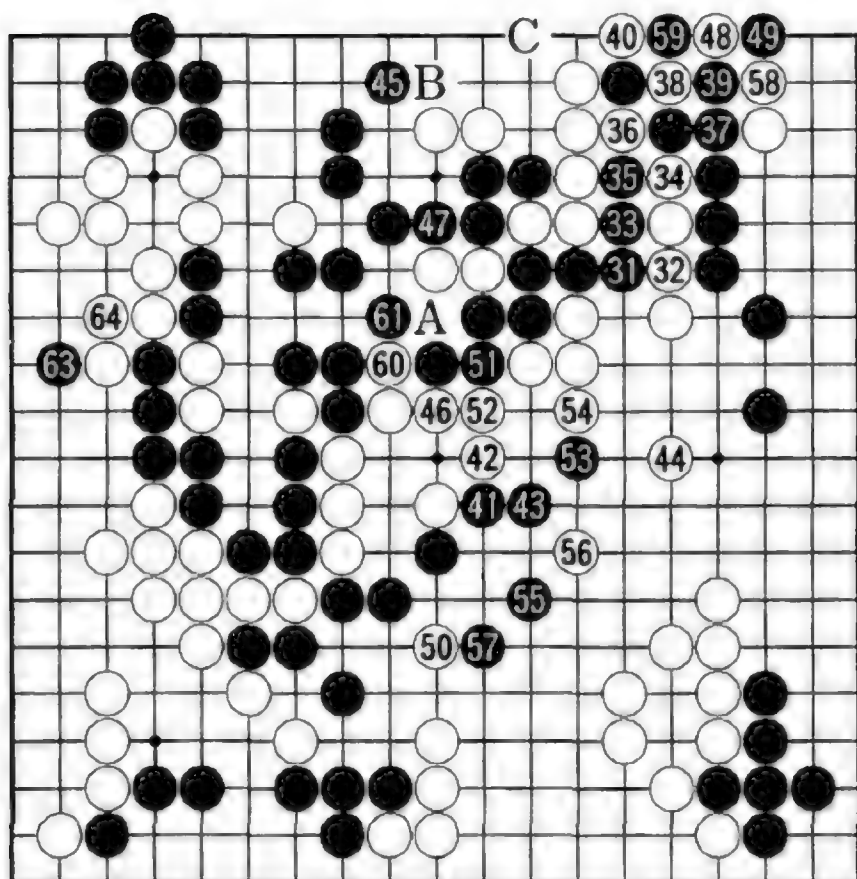


Figure 4 (131-165)
62, 65: ko

Figure 4 (131-165). *Unnecessary complications*
Black 47. Black should play at A.

Black 49 is overdoing things. If White connects at 59, Black's intention is not to connect at 58 but to slide to C, but this strategy would be risky. There's no need to be so aggressive — pulling back at 58 would be good enough; after White B, Black could then jump to 55.

White 58 starts a confused fight.

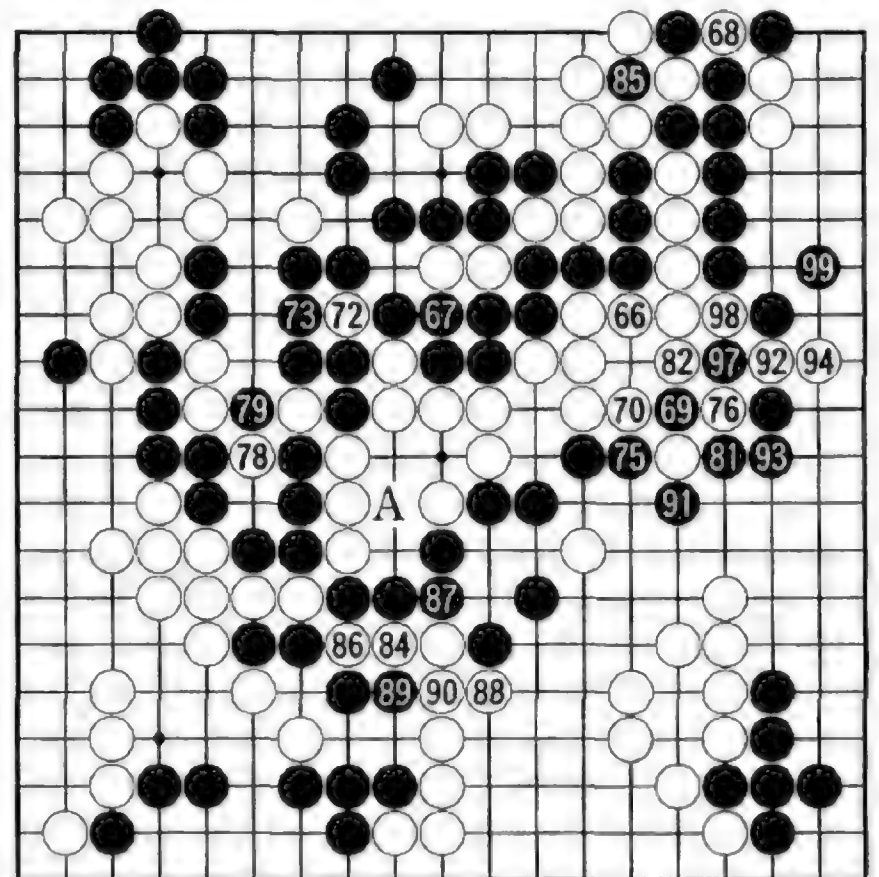


Figure 5 (166-200)
ko: 71, 74, 77, 80, 83; 95: ko (at 69);
96: ko (right of 85); 100: ko (at 76)

Figure 5 (166-200). *Could go either way*

Black finishes off the *ko* by playing 85, but the usual way to do so would be to connect at 68. Black's move has a subtle effect on the game.

Black's territory at the top is so big that she seems to have the lead, but that is not necessarily the case. In fact, when White wedges in at 92, Black seems to be in danger of suffering an upset if she can't stop him.

However, White slips up: capturing the *ko* at the top with 96 is a mistake. O: 'If White had used 96 to connect at 97, then, after Black 99, lived with A, he would have been slightly ahead.'

Figure 6 (201-240). *White's last chance*

When Black puts the centre group into *ko* with 23, White concludes that he can't fight to the end and so ends the *ko* with 30. O

queried this decision: can't White answer 29 at 31?

'When Black captures the *ko*, White hanes at 34. Black has to give ground all the way — wouldn't that leave the game very close?'

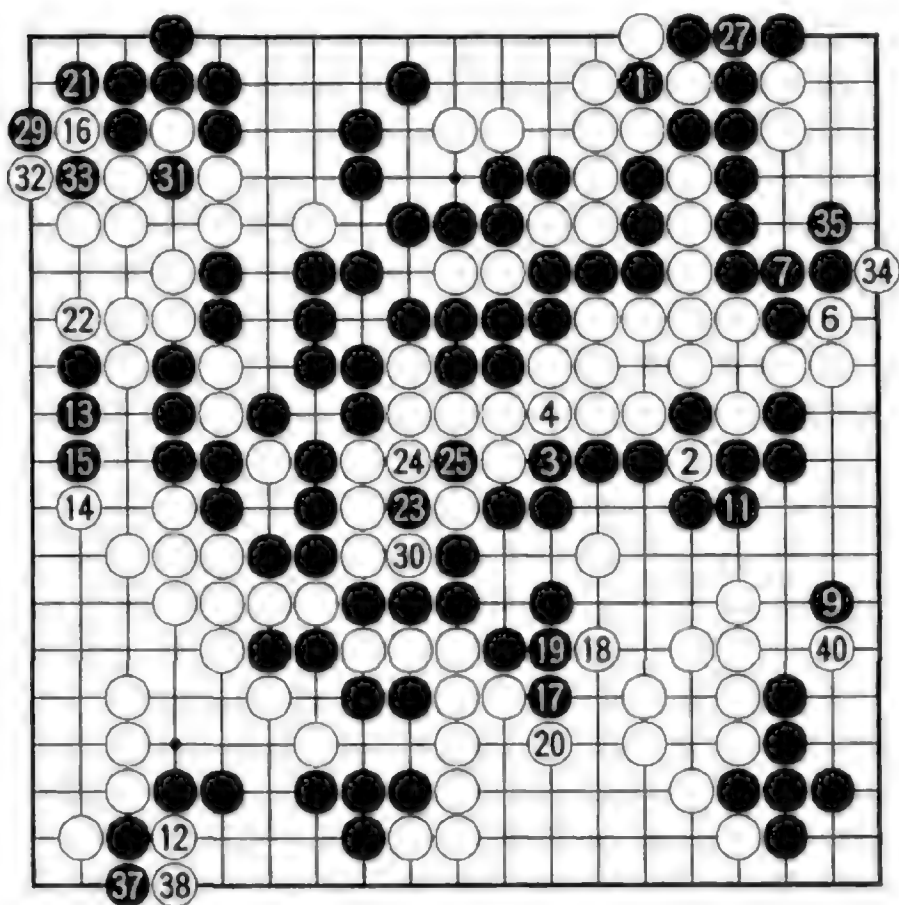


Figure 6 (201-240)

5: *ko* (above 2); 8: *ko* (at 2);

10: connects (above 2); 26: *ko* (right of 1);

28: *ko* (below 25); 36: *ko* (at 16); 39: *ko* (at 33)

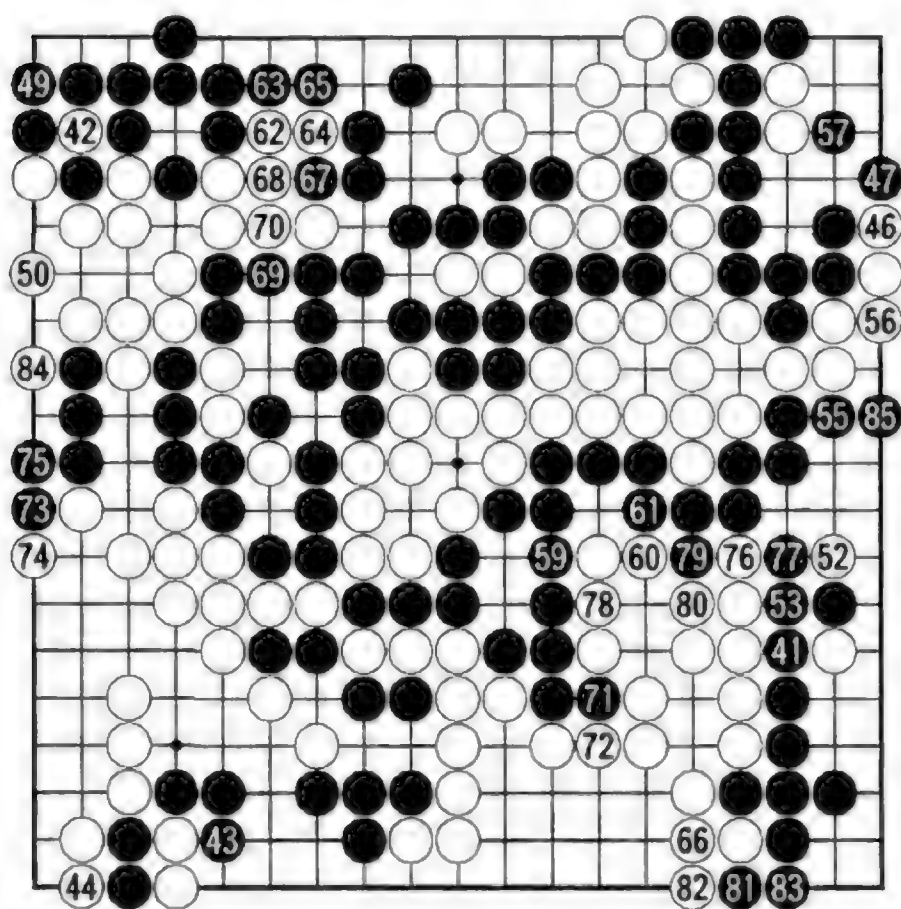


Figure 7 (241-285)

ko: 45, 48, 51, 54; 58: connects (below 42)

Figure 7 (241-285). A triumph for Hua

White lives, but he can't win after suffering Black 55.

Hua looked bewildered after the score was counted. The game had been a violent one and she didn't understand the Japanese counting method. It was not until Otake said to her 'You win' that she smiled for the first time. With this win, she became the third woman player to score a significant success in international tournament play, thus joining her compatriots Rui Naiwei and Yang Hui.

Black wins by 2½ points.

(Fujitsu report adapted from the Yomiuri newspaper. Translated by John Power.)



Does Hua play better against male opponents? Her best result in a women's tournament is 3rd in the Chinese Women's Championship, yet in 1989 she took second place in the All-China Individual Championship, which is open to men and women. And now she had beaten a former Fujitsu World Champion.

Korean Go: The Age of Lee

As reported in our previous issue, Lee Chang-ho, with 12 out of 16 titles, is completely dominating the tournament scene in Korea. In this report, we would like to take a look at some of his recent title games.

In the majority of Lee's title matches to date, his opponent has been his teacher, Cho Hun-hyun, who virtually monopolized Korean go titles in the latter half of the 70s and the 80s. Despite his inability to cope with his disciple, Cho is still indisputably one of the world's top players, as demonstrated by his continuing success in international titles (he does much better in the Fujitsu and Ing cups than Lee). The prolonged contest between the two is a treasure house of top-level go. In late 1993 and early 1994, they set an unusual record — one that would be almost unthinkable in Japan — of playing what amounted to a best-of-27 in five successive title matches.



Lee Chang-ho

A summary of recent title-match results will make clear the extent to which the Korean tournament scene revolves around Lee.

- In October and November 1993, Lee challenged for the 16th Kukgi (National Go Championship) title. He beat the title-holder, Seo Bong-soo 3-1, so Seo lost his only Korean title (he remains Ing World Champion for another three years, of course).

- In November, Lee beat Cho Hun-hyun 3-2 to win the first term of a new title, the Mobile Communications Cup. (All five games were played during November).

- In the 5th Go Saint tournament (Korea's top title, the Go Saint is written with the same characters as Japan's Kisei but seems to be organized more like the Meijin title), Seo started with five straight wins in the eight-man league, but then lost to Yoo and Cho, who forced a three-way tie. In the playoff, Yoo beat Seo but then lost to Cho. However, Cho's challenge was a disaster: Lee won four straight. (The match was probably played in early 1994 — our sources on Korean go often omit dates.)

- In the 11th Great King title, also played in early 1994, Cho scored one of his increasingly rarer successes against Lee. He won three straight to take the title from Lee.

- In the 12th KBS King of Go, a TV title, Cho beat Yoo 2-0 in the final.

- In the Monarch tournament, Cho had set an extraordinary record by winning the title for 16 years in a row, but his reign finally came to an end when Lee challenged him in February 1994. Lee won the match 3-1.

- In spring of 1994, Lee challenged Cho in the 28th King of Go title and won 3-1. That concluded the five-title series between the two, with the results four victories to one in Lee's favour. It also marked two other milestones. First, it was Lee's 13th concurrent title, a new record for him, and it also completed a grand slam — he has now won each of the 16 Korean titles.

The statistics are awesome for both these players. Over the last two decades, Cho has won a grand total of 131 Korean titles. That might seem like a formidable target, but in just three years or so Lee has already won 37 titles. What kind of total is he going to end up with?

In this article we would like to present a selection of games from these titles. Since we don't read Korean, our choice is limited to games that have appeared in the Japanese magazine *Igo*, which briefly covers Korean

go each issue. The commentaries are by Kim In 9-dan, who was the top player in Korea from the mid-60s to the mid-70s.

16th National Go Championship Game Two

White: Seo Bong-soo 9-dan
Black: Lee Chang-ho 6-dan
Komi: 5½; time: 5 hours each.
Played on 30 October 1993.
Commentary by Kim In 9-dan.

This game is one of Lee's rare failures. It features a spectacular sacrifice by Seo.

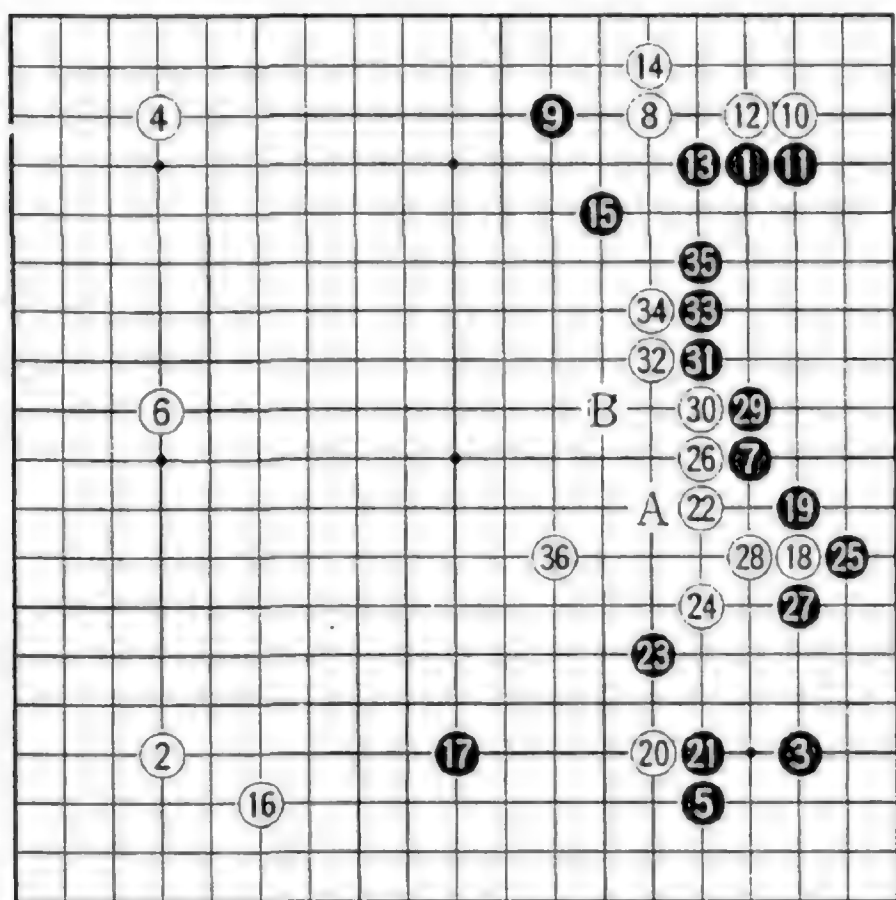


Figure 1 (1-36)

Figure 1 (1-36)

The opening to 6 is unusual for Seo.

Black 25 should be at 26. After White A, Black B would make an excellent position.

Figure 2 (37-73)

In response to Black 59 and 61, White launches a shrewd sacrifice strategy up to 70. He is satisfied with his outside influence.

White 72 should be at A. The game becomes close when Black extends to 73.

Figure 3 (74-100)

With 75, Black tenukies in order to attack in the centre, but living in the corner is really

big.

When Black attacks with 81 and 83, White parries him with 84 and 86 and the attack immediately runs out of steam.

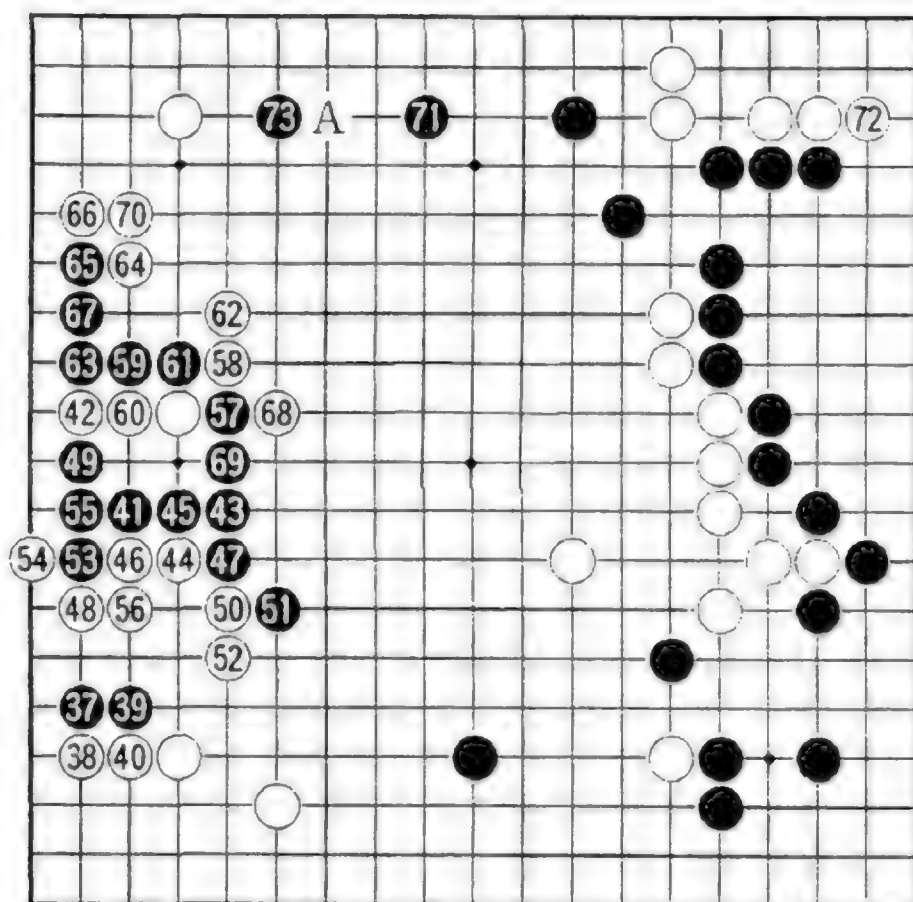


Figure 2 (37-73)

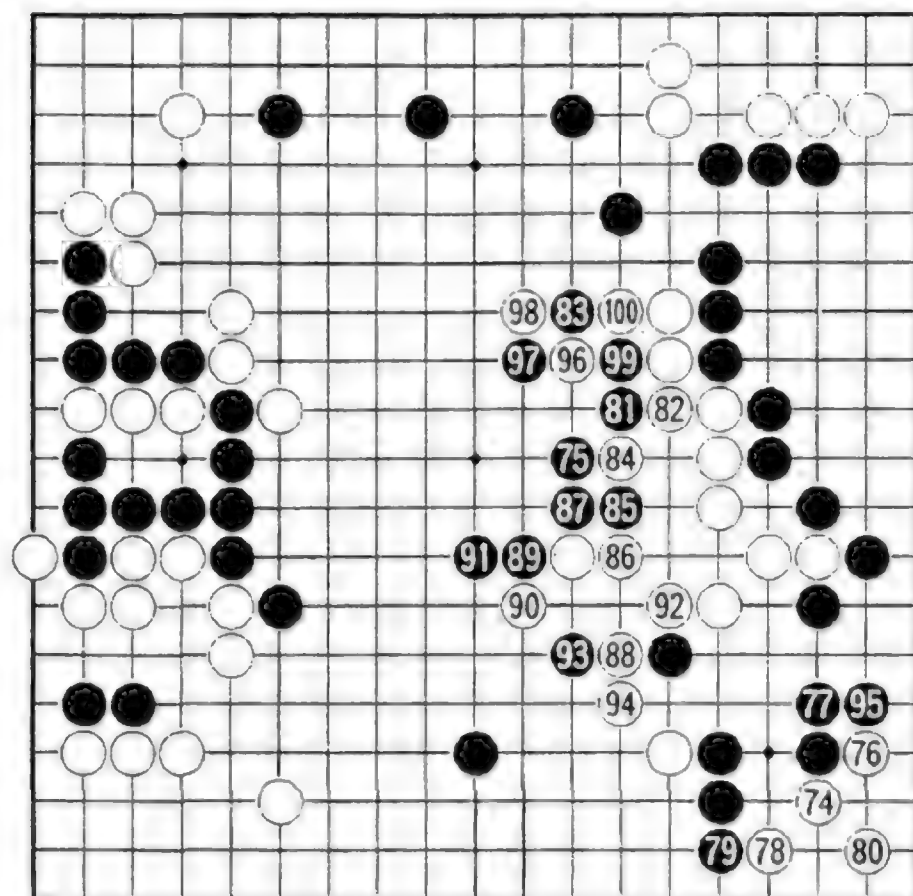


Figure 3 (74-100)

Figure 4 (101-138)

Black 11. Black should block at A.

Dia. 1 shows what happens if Black cuts after White 38.

This win enabled Seo to even the series, but Lee made no mistake in the third and fourth games.

Black resigns after White 138.

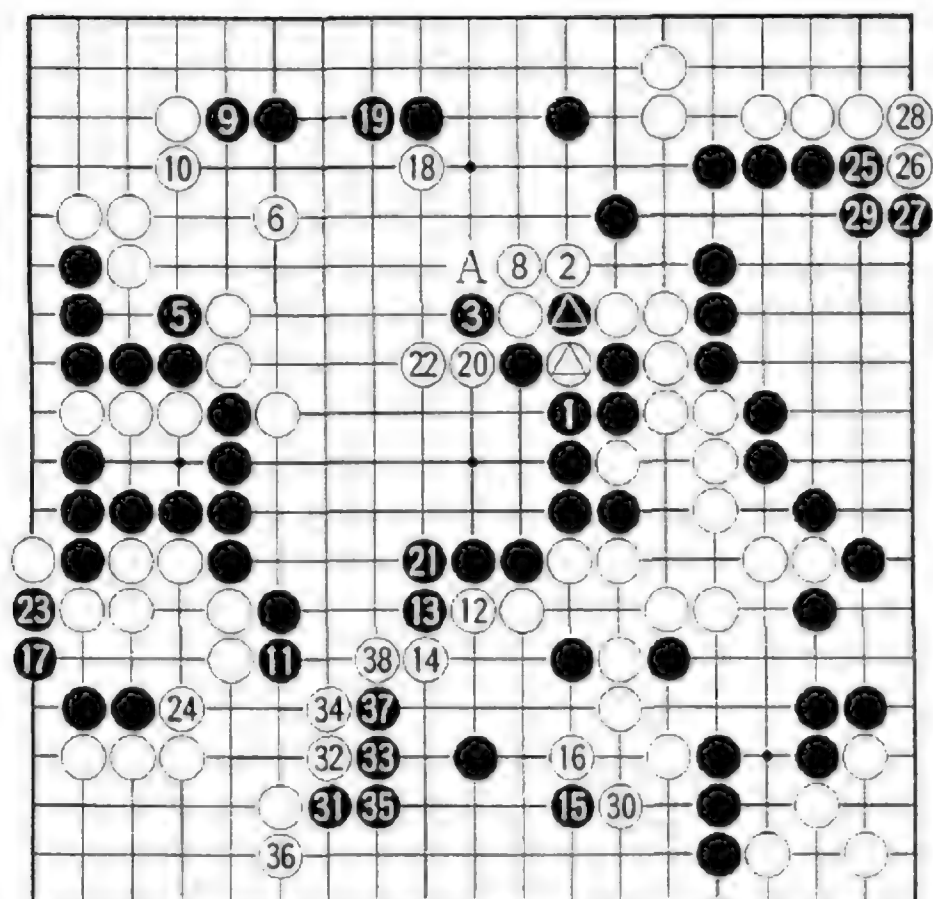
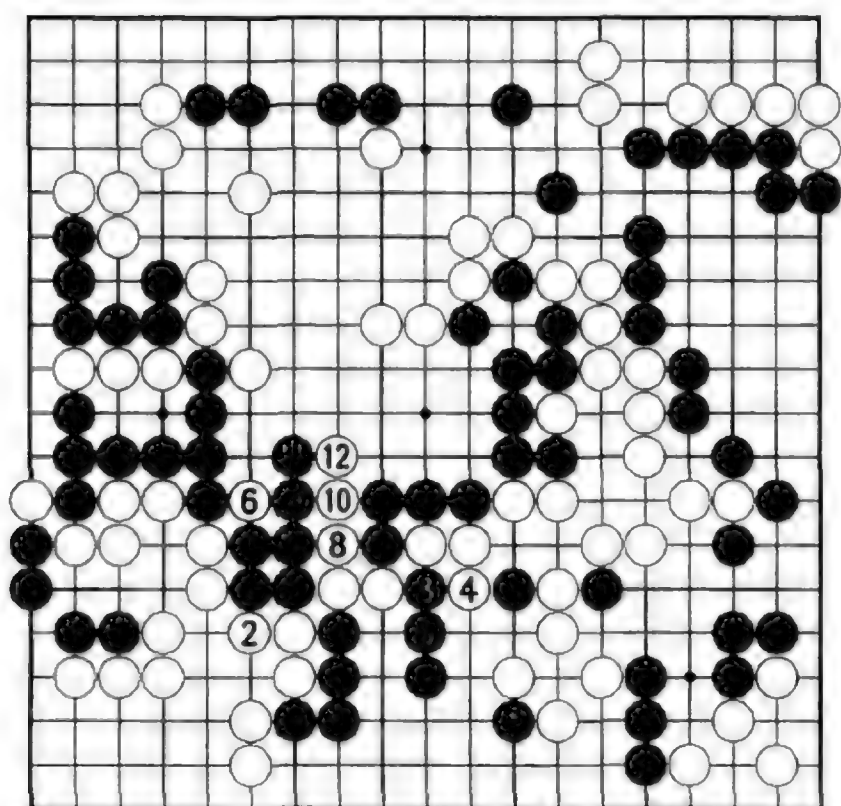


Figure 4 (101-138)
4: ko (marked white stone)
7: ko (marked black stone)



Dia. 1

1st Mobile Communications Cup Game Four

White: Lee Chang-ho 6-dan
Black: Cho Hun-hyun 9-dan
Komi: 5½; time: 3 hours each.
Played on 22 November 1993.
Commentary by Kim In 9-dan.

Figure 1 (1-41)

The moves to 20 are a common *fuseki*.

White 40, permitting Black to split the left side into two with 41, is perhaps dubious. White might have been better advised to play 40 at A.

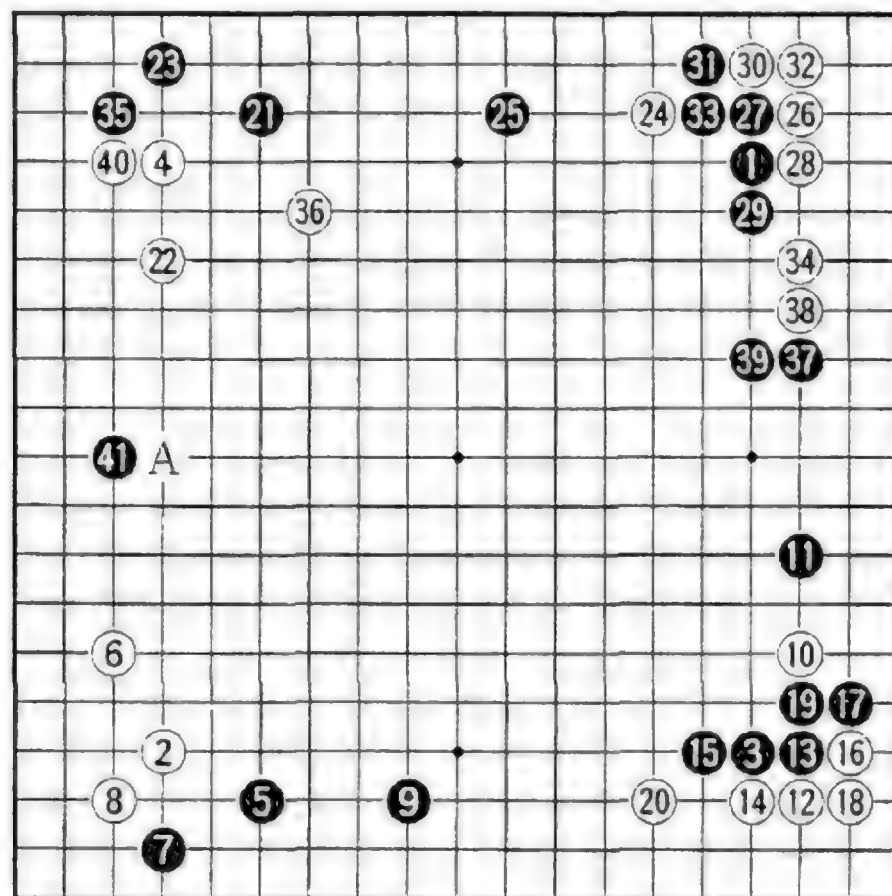


Figure 1 (1-41)

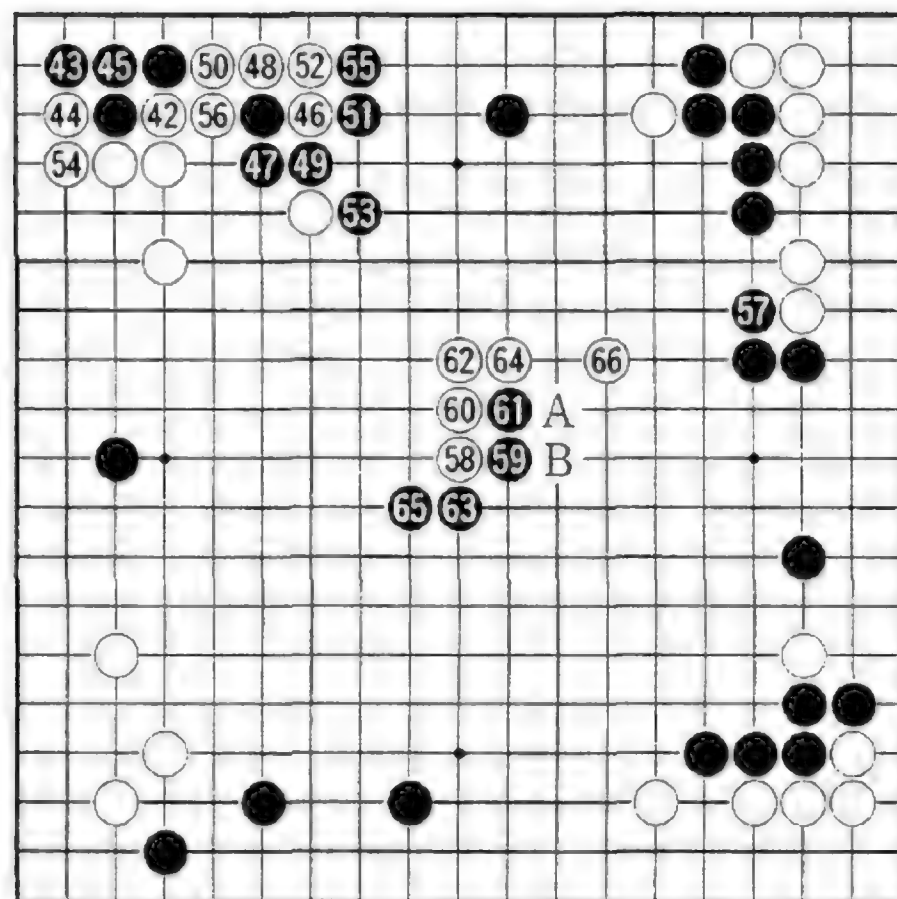


Figure 2 (42-66)

Figure 2 (42-66)

White 48 is a severe move, but it invites a counterattack. Up to 56, White does not gain anything.

Black 59 is dubious — White lays waste to his *moyo* up to 66. Instead of 59, defending at A or B would have kept the game simpler.

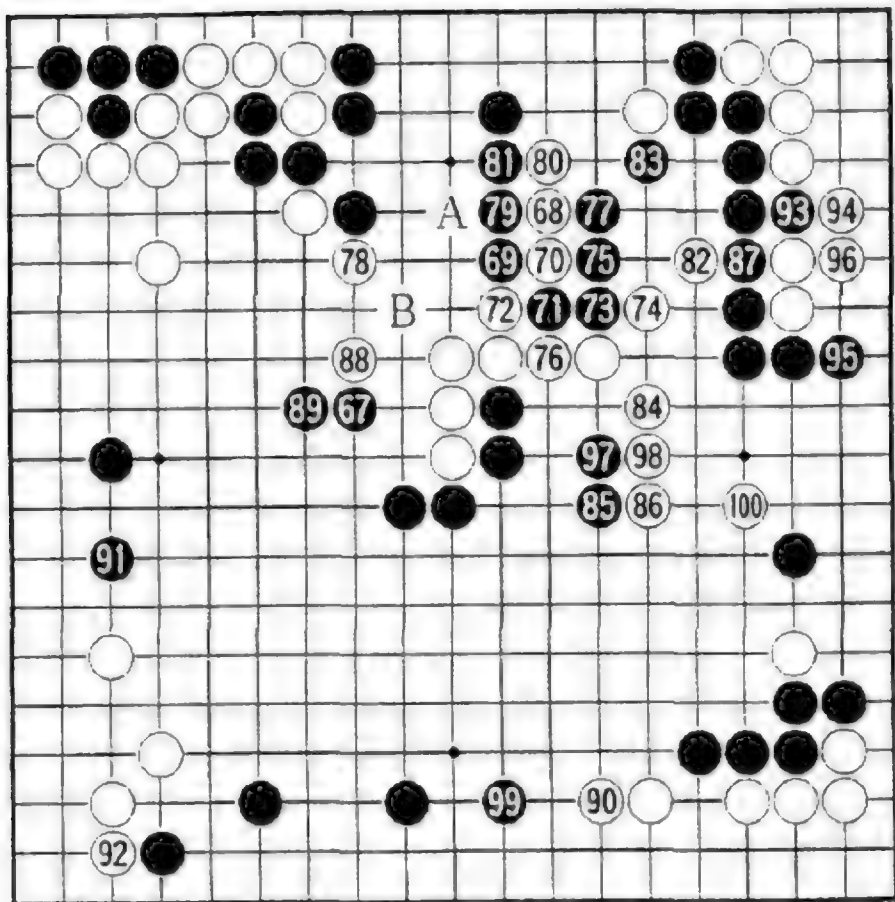


Figure 3 (67-100)

Figure 3 (67-100)

White 74. If White plays 76, Black 74, White A, then Black B will be severe. It would put White on the spot.

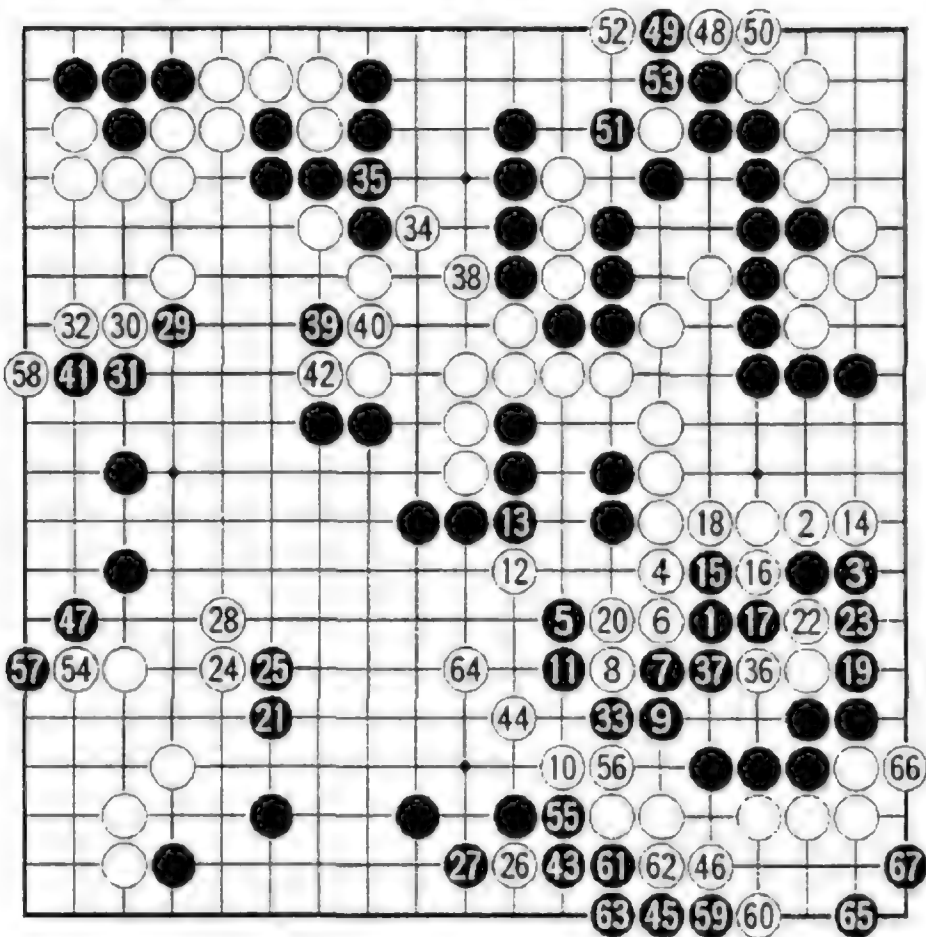


Figure 4 (101-167)

Figure 4 (101-167)

The game is close, but instead of 24 White should play at 44 to see how Black answers.

Black 43 decides the game.

This is another loss for Lee, which may seem to belie our title, but it is the only game from the title match given in *Igo*. In the final

game, played on 30 November, Lee won by 6½ points, playing white, to clinch the title.

White resigns after Black 167.

5th Go Saint Title Game Three

White: Lee Chang-ho 6-dan

Black: Cho Hun-hyun 9-dan

Komi: 5½; time: 5 hours each.

Played in early 1994.

Commentary by Kim In 9-dan.

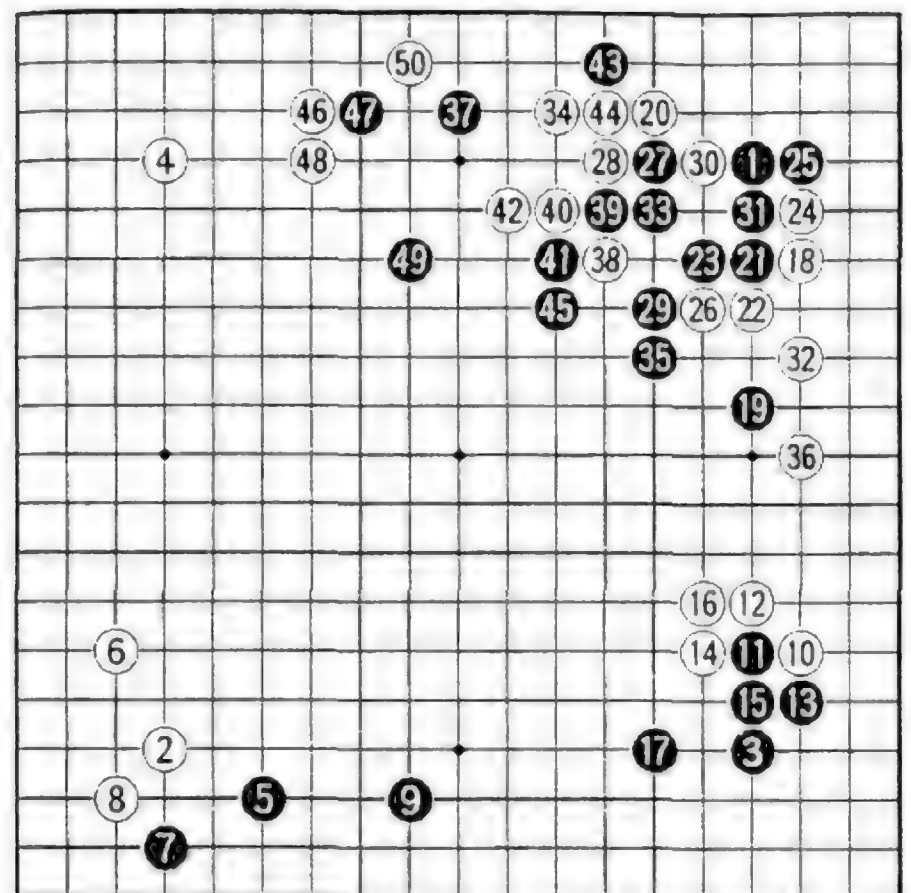


Figure 1 (1-50)

Figure 1 (1-50)

Black 35. Better to play a probe with Black 37 first. White's peep at 38 works perfectly, and the result to 46 is not satisfactory for Black.

Figure 2 (51-100)

White 56. Making a pincer at A looks tempting, but Lee said he didn't like the idea of having Black invade the 3-3 point at B.

Black 63 is surprising. The result to 74 doesn't look good for Black.

Figure 3 (101-150)

Presumably because he feels he is behind (the commentary is not more explicit here), White plays severe, do-or-die moves with 8, 20, and 22.

Black 27 is a mistake. If Black blocked off

the centre with A, he would be ahead.

Black 41 is the losing move. If instead Black had attacked White's eye shape with Black 46, White would have been in trouble. When he lives with 42, the game is over.

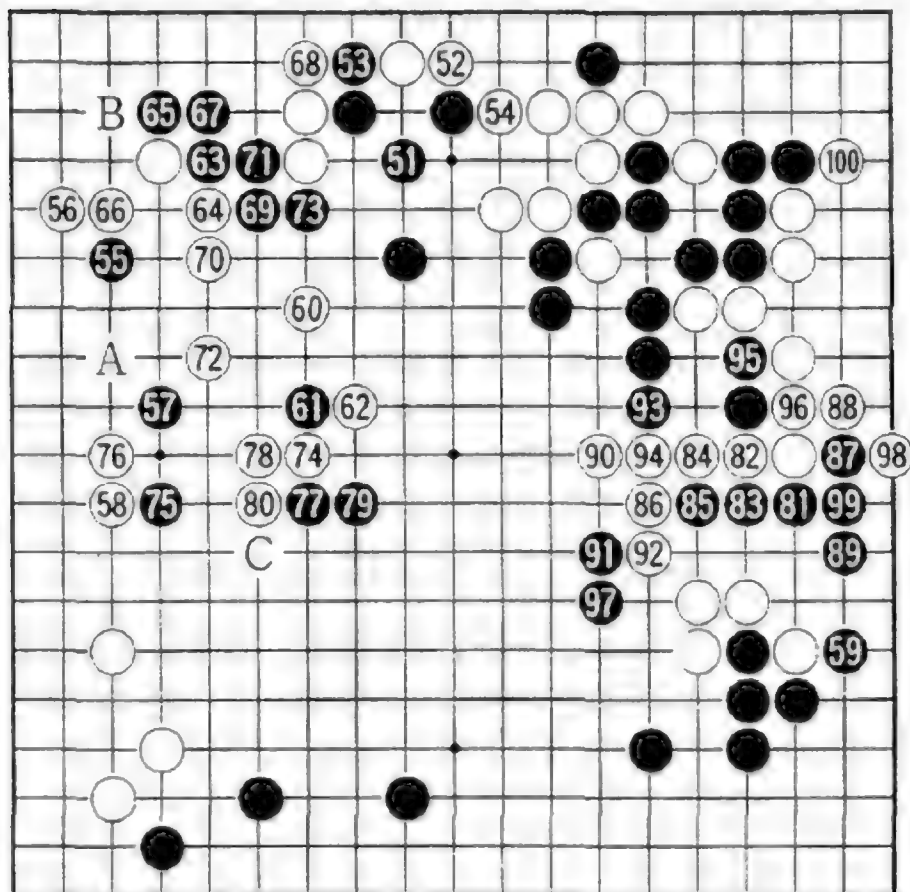


Figure 2 (51-100)

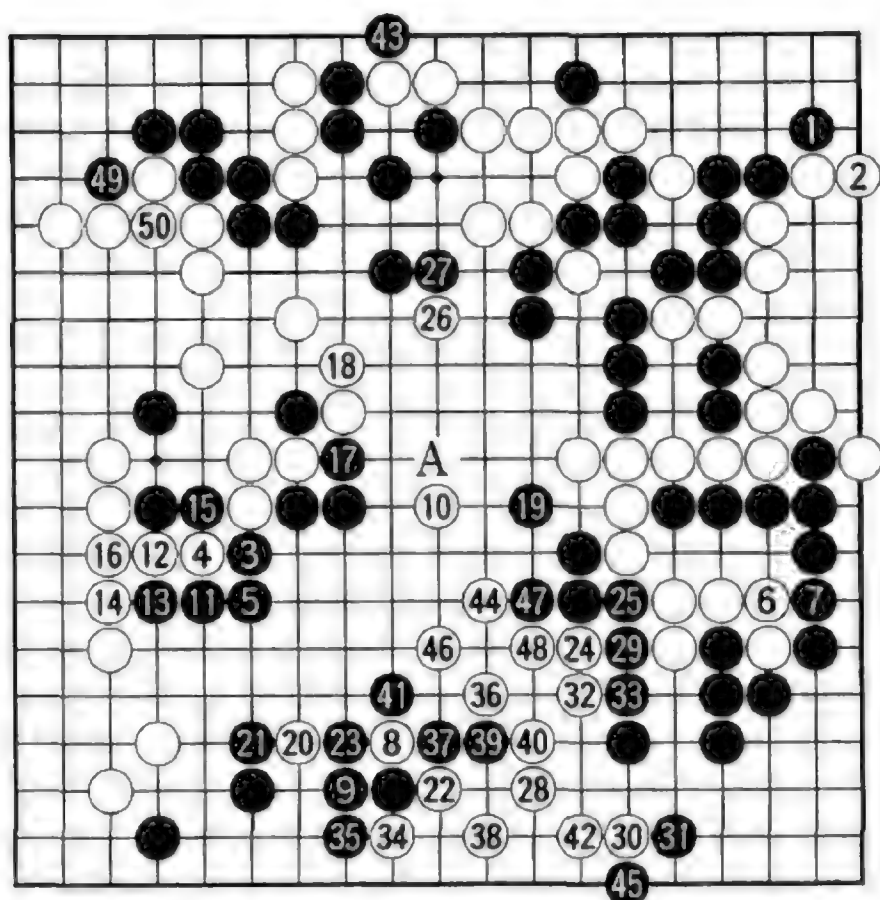


Figure 3 (101-150)

Figure 4 (151-200)

Figure 5 (201-257)

White wins by $4\frac{1}{2}$ points.

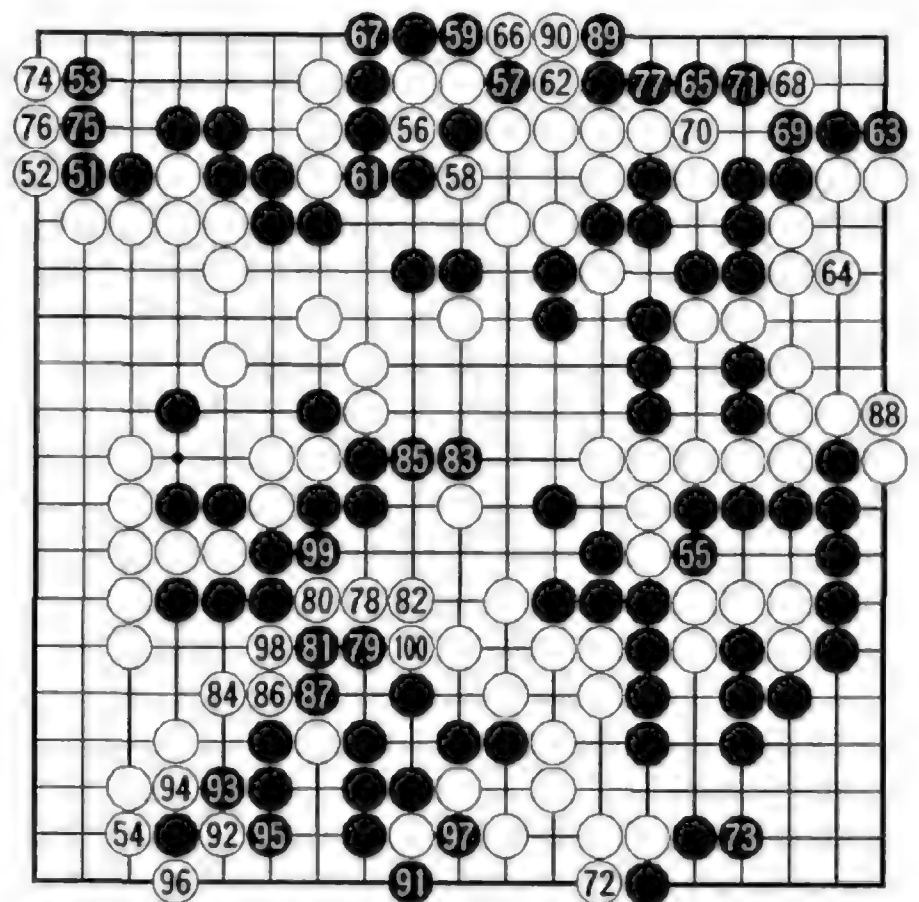


Figure 4 (151-200)

60: connects

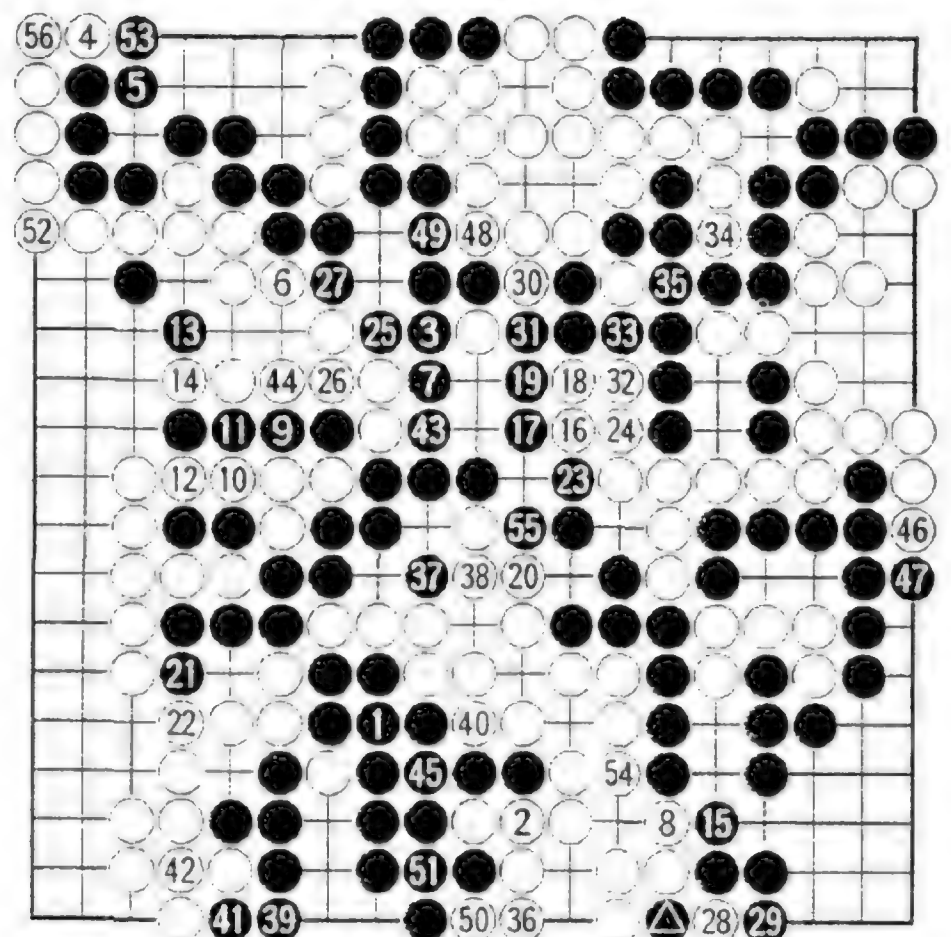


Figure 5 (201-257)

57: ko (the marked stone)

Black wins and connects the ko.

29th Monarch Title

Game Four

White: Lee Chang-ho 6-dan

Black: Cho Hun-hyun 9-dan

Komi: $5\frac{1}{2}$; time: 5 hours each.

Played on 25 February 1994.

Commentary by Kim In 9-dan.

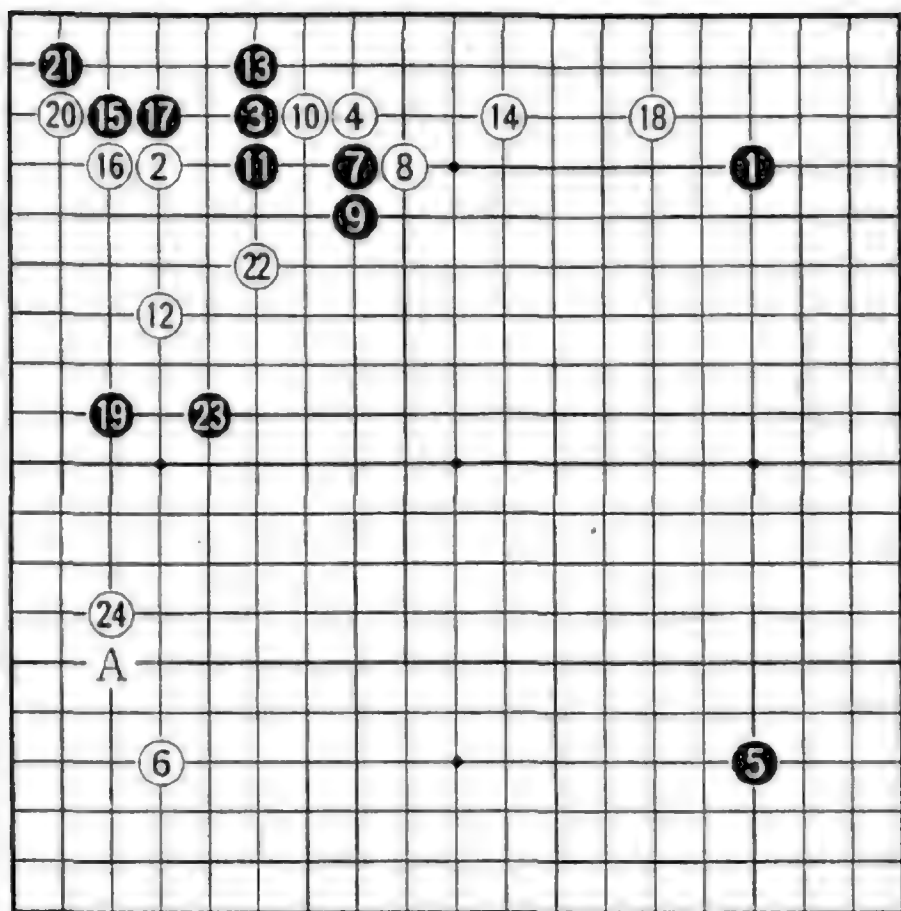


Figure 1 (1-24)

Figure 1 (1-24)

White 24 shows fighting spirit. White can't permit Black A, as that would make ideal shape with 19 and 23.

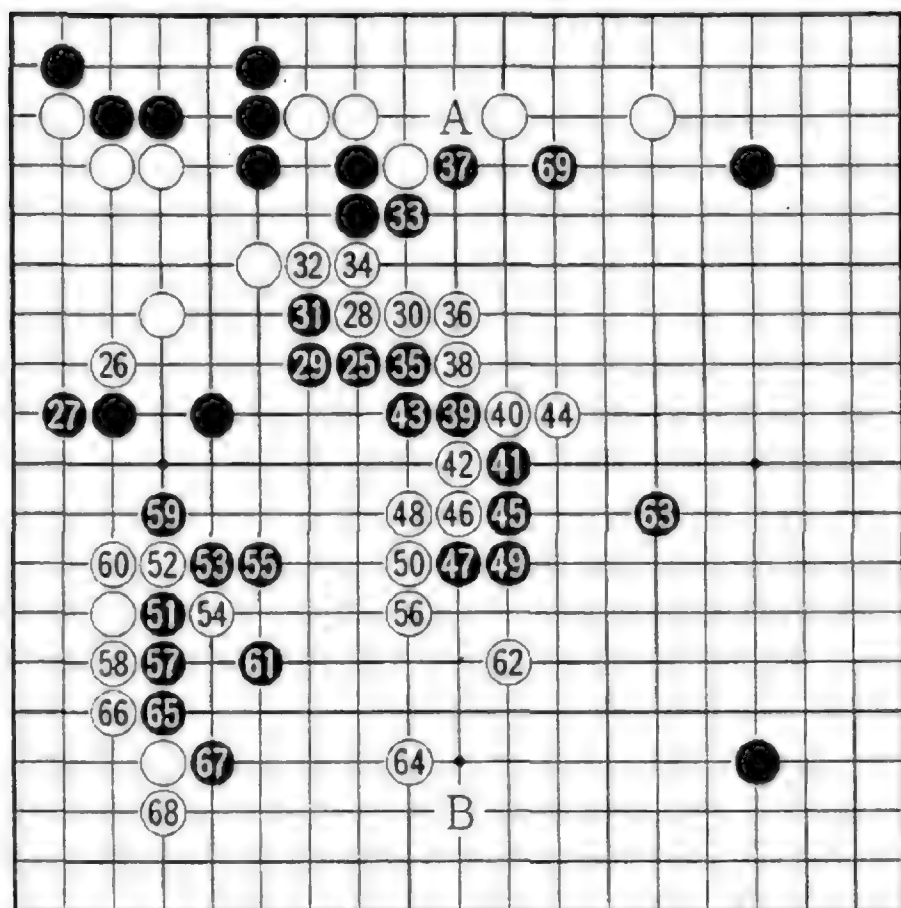


Figure 2 (25-69)

Figure 2 (25-69)

White 46, 48. Going into action here immediately is very aggressive — playing at A or B would be more peaceful. After 50, Black has the severe counter of 51, which threatens a double attack.

White 56. White could simplify by making a *ponnuki* at 57, giving up the stones in the centre. Black secures the lead with 57 to 69.

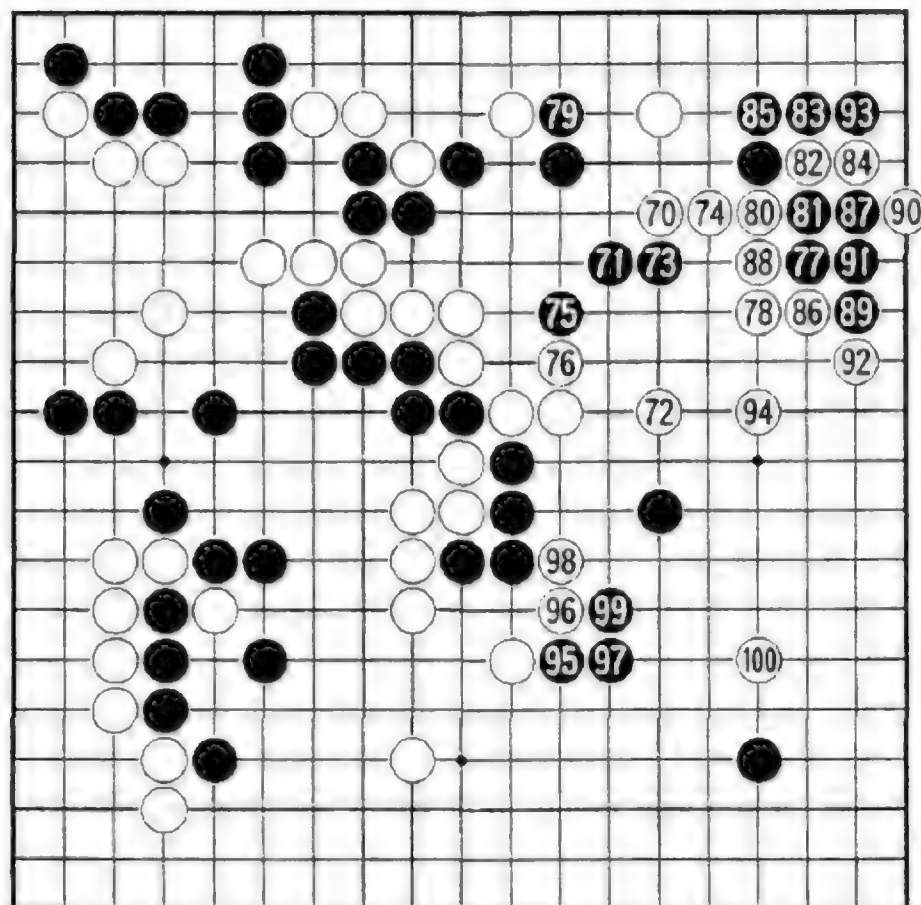


Figure 3 (70-100)

Figure 3 (70-100)

White 70. I'd prefer to answer at 79.

Figure 4 (101-143)

White 24 is a do-or-die move. White judges that answering 23 at A will lose. However, up to 43 his gamble fails.

White resigns after Black 143.

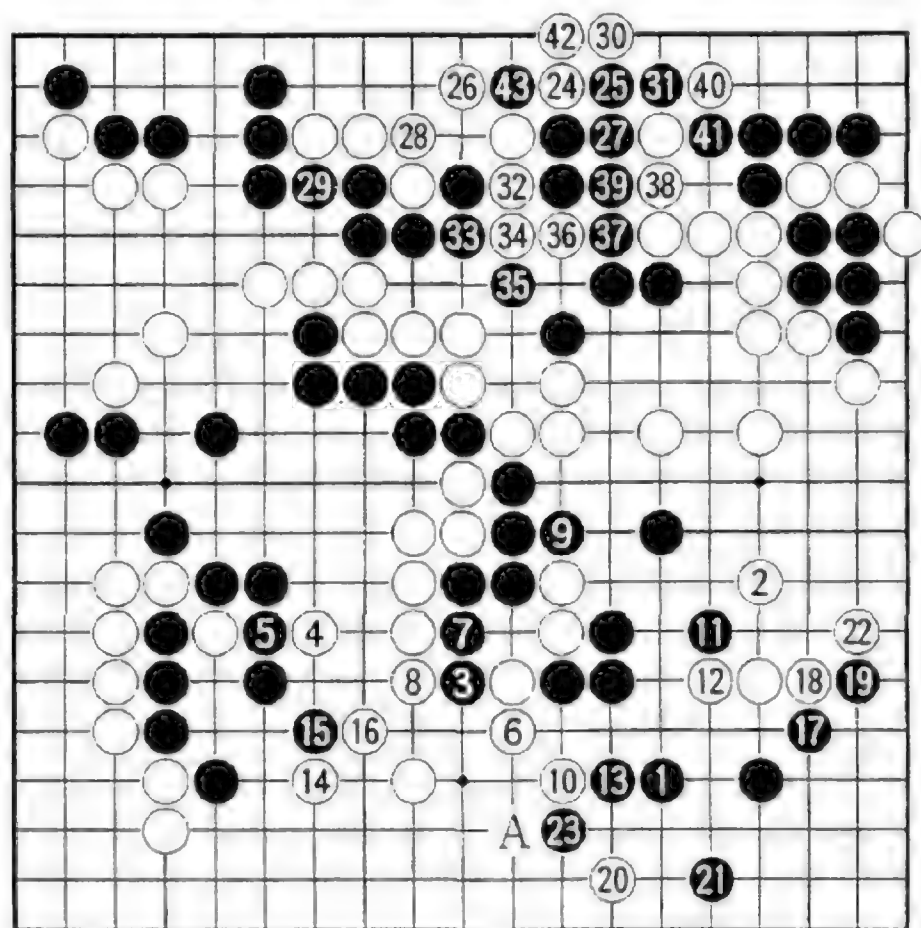


Figure 4 (101-143)

33rd Top Position Title Game Three

Lee and Cho also met in the 1994 Top Position title match. This was another successful challenge for Lee, who didn't drop a game. Below is the win that gave him the title.

White: Cho Hun-hyun

Black: Lee Chang-ho

Komi: 5½; time; 5 hours each.

Played on 28 March 1994.

Commentary by Kim In 9-dan.

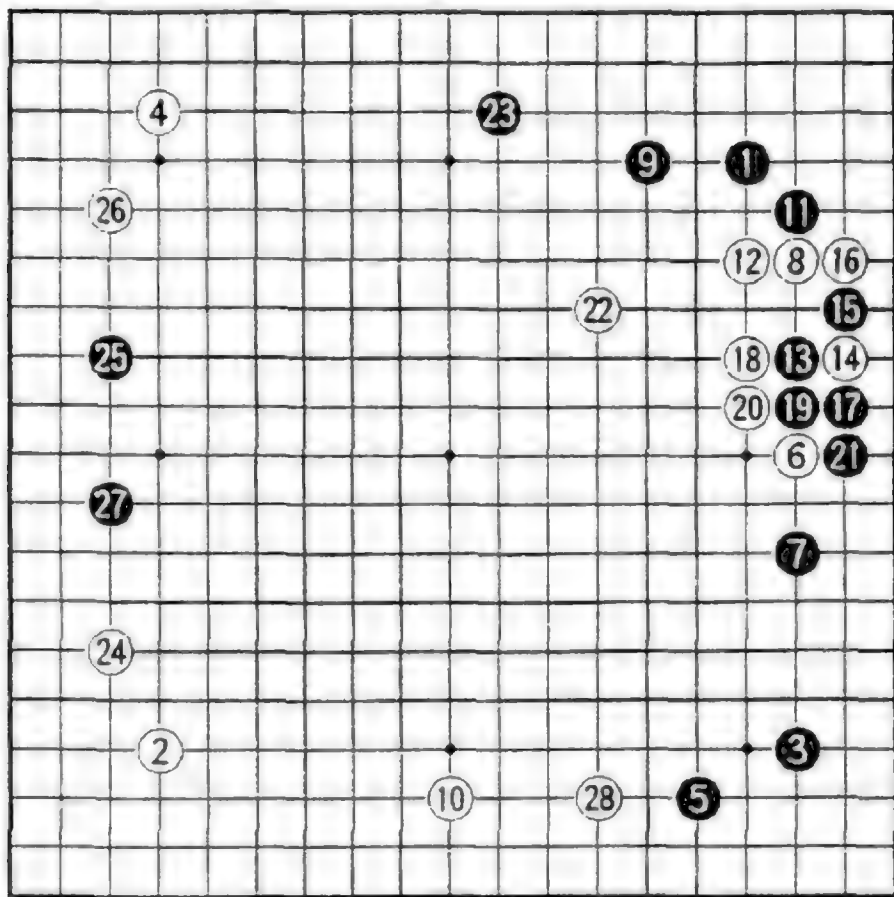


Figure 1 (1-28)

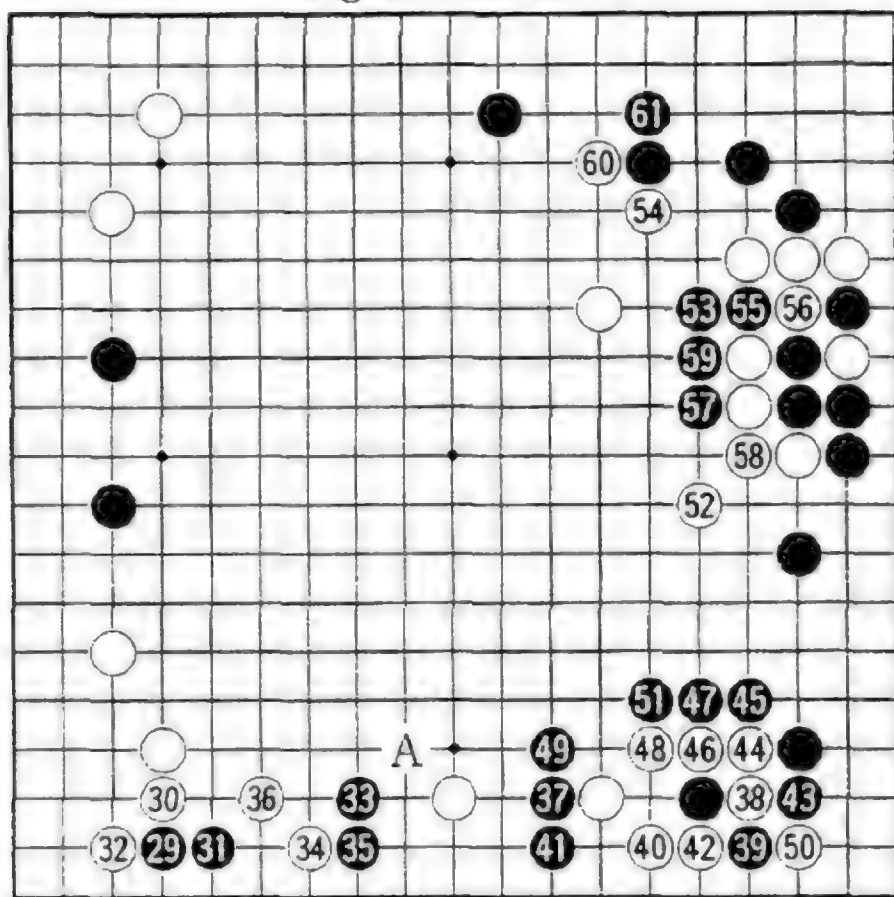


Figure 2 (29-61)

Figure 1 (1-28)

The 11-13 combination is a favourite of Lee's.

Up to 28 we get a leisurely *fuseki* that is not bad for White.

Figure 2 (29-61)

Black 29. Reducing with A would be the usual approach.

White 34 and 36 are dubious, as they make Black 37 a good move. Black gets a thick position when he seals White in up to 51.

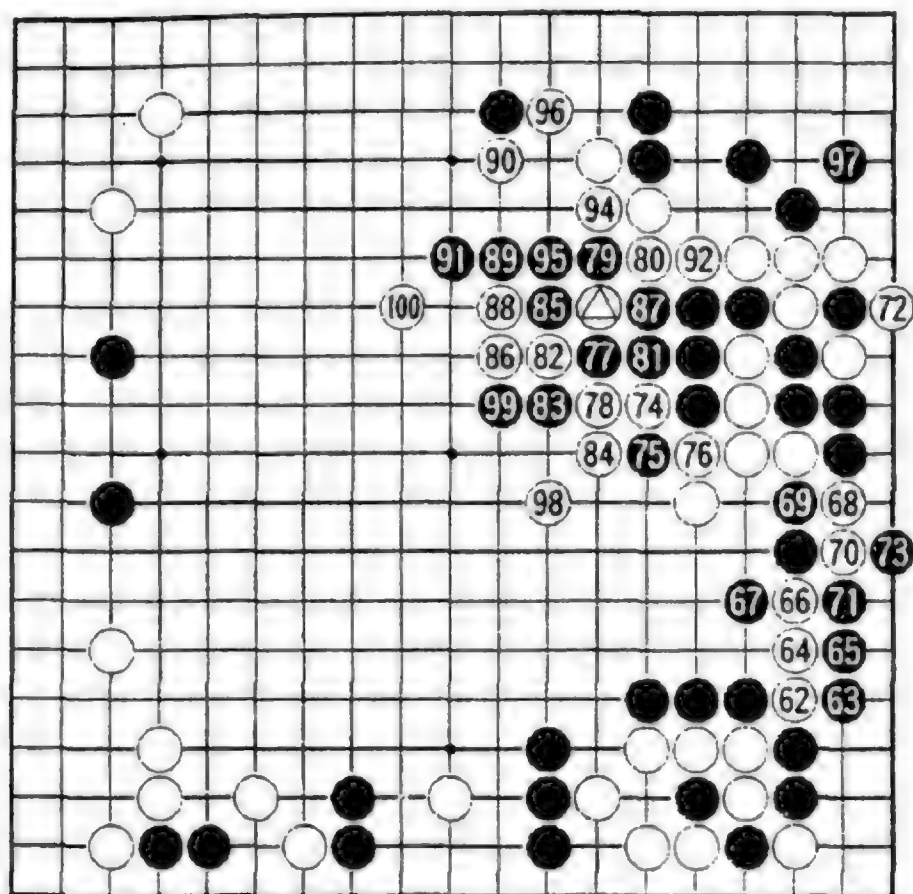


Figure 3 (62-100)

93: connects (the marked stone)

Figure 3 (62-100)

Cho spent 98 minutes on 62; he was working out his sacrifice strategy up to 74, but it feels a little unreasonable. The sequence from 75 to 97 is a one-way street.

Figure 4 (101-159)

When Black gets to make the diagonal connection at 7, all the pressure is on White.

White 20 is a do-or-die move, but when Black defends at 27 White's large group dies.

This is a spectacular game that shows that Lee is much more than just a territorial player.

White resigns after Black 159.

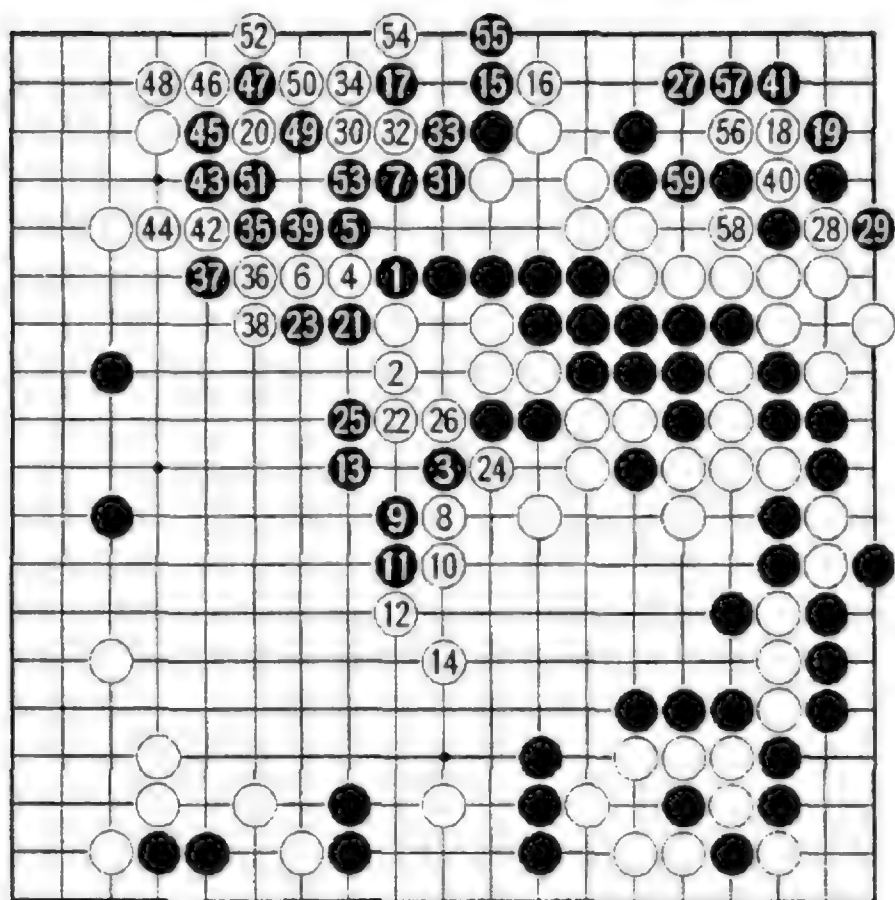


Figure 4 (101-159)

18th King of Go Title Game Four

This is the game that completed the grand slam for Lee and took his concurrent tally of titles to 13, which is quite a high proportion of the 16 Korean titles.

White: Cho Hun-hyun

Black: Lee Chang-ho

Komi: 5½; time: 5 hours each.

Played in spring 1994.

Commentary by Kim In 9-dan.

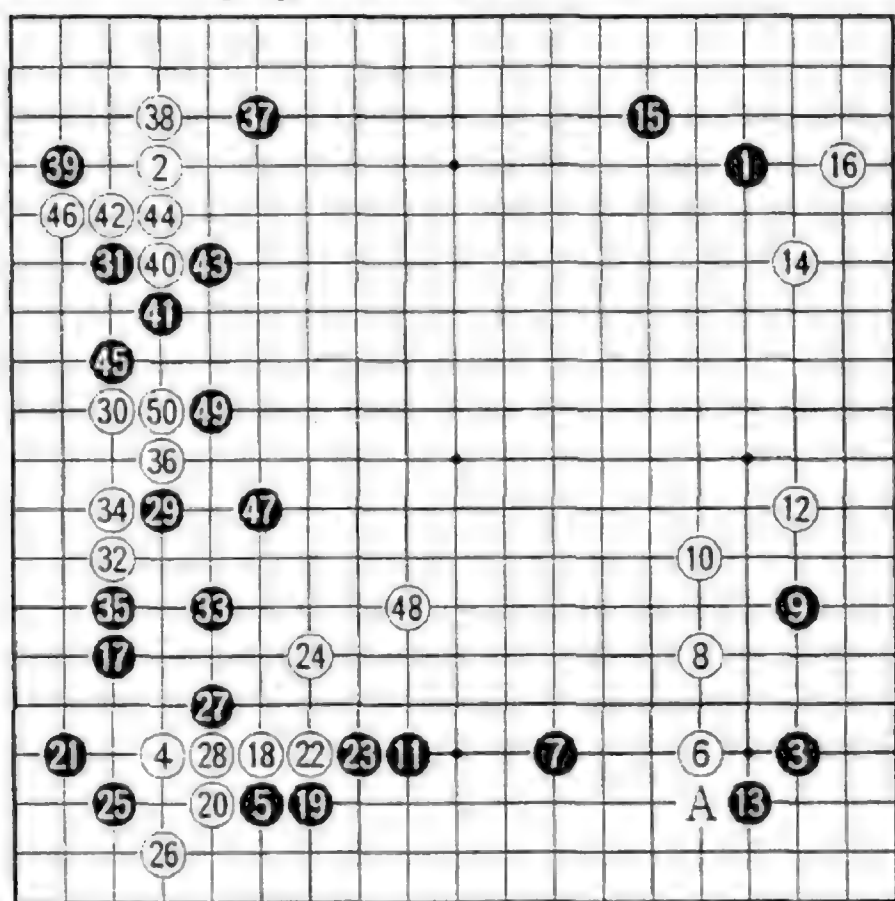


Figure 1 (1-50)

Figure 1 (1-50)

Black 19. Making a *hane* at 22 would just help the opponent.

Black 29. Black probably should link up with A. Instead of 30, I'd prefer to block at A.

White 36. A one-space jump to 49 would be better.

Black 47 is a good move. The game is going well for Black when he seals White in with 49.

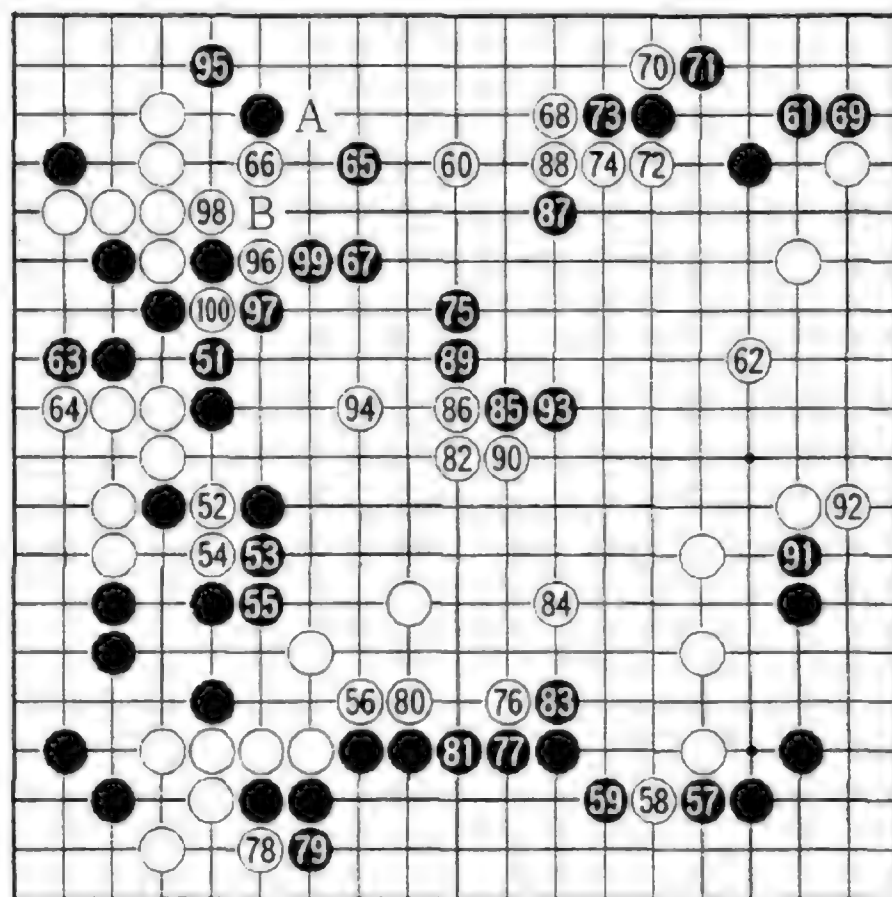


Figure 2 (51-100)

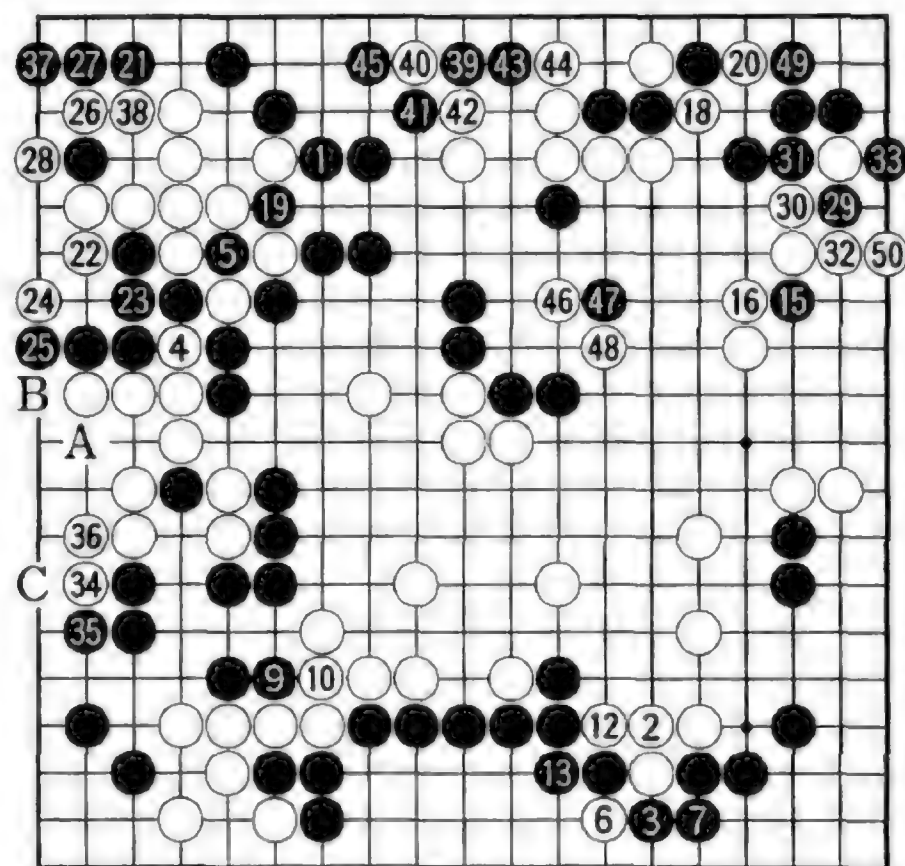


Figure 3 (101-150)
ko: 8, 11, 14, 17

Figure 2 (51–100)

White 82 is a good point. The game has become close.

White 94 is dubious: he should *hane* at A.

Black 95 is a mistake: Black must instead play patiently at B. Black is in trouble after White 96 and 98.

Figure 3 (101–150)

White 6 is the losing move: White should cut at 7 instead, as that would give him more *ko* threats.

White 34. If omitted, Black gets a *ko* with A, White B, Black C.

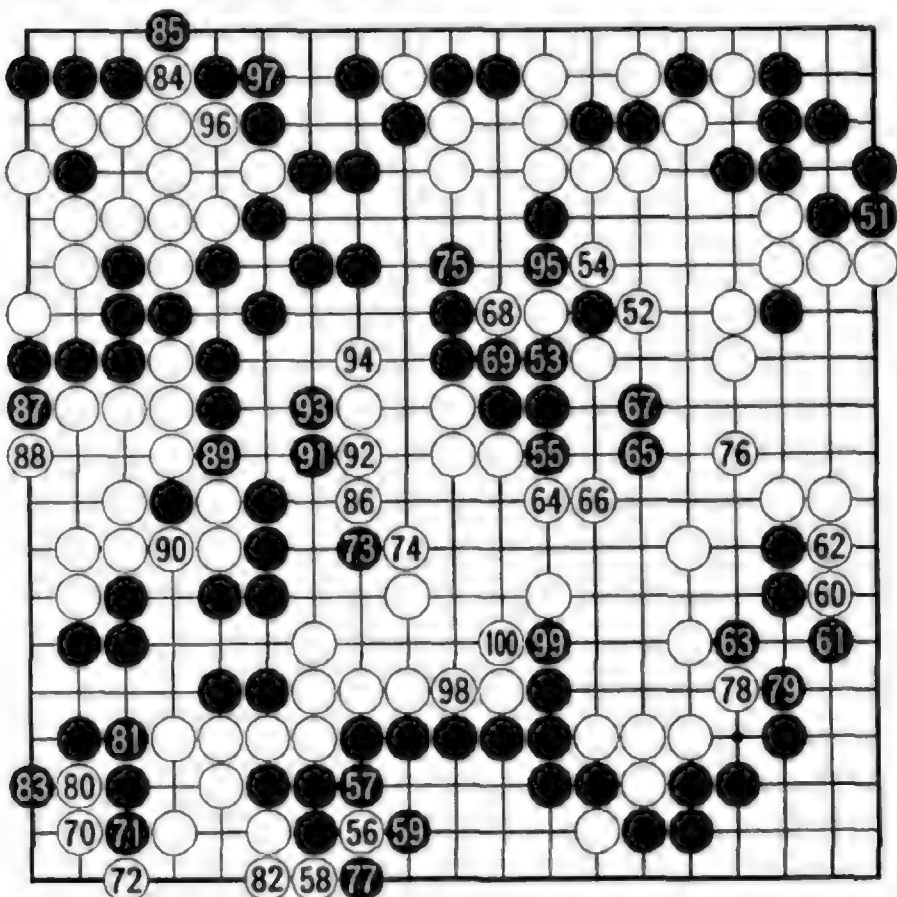


Figure 4 (151–200)

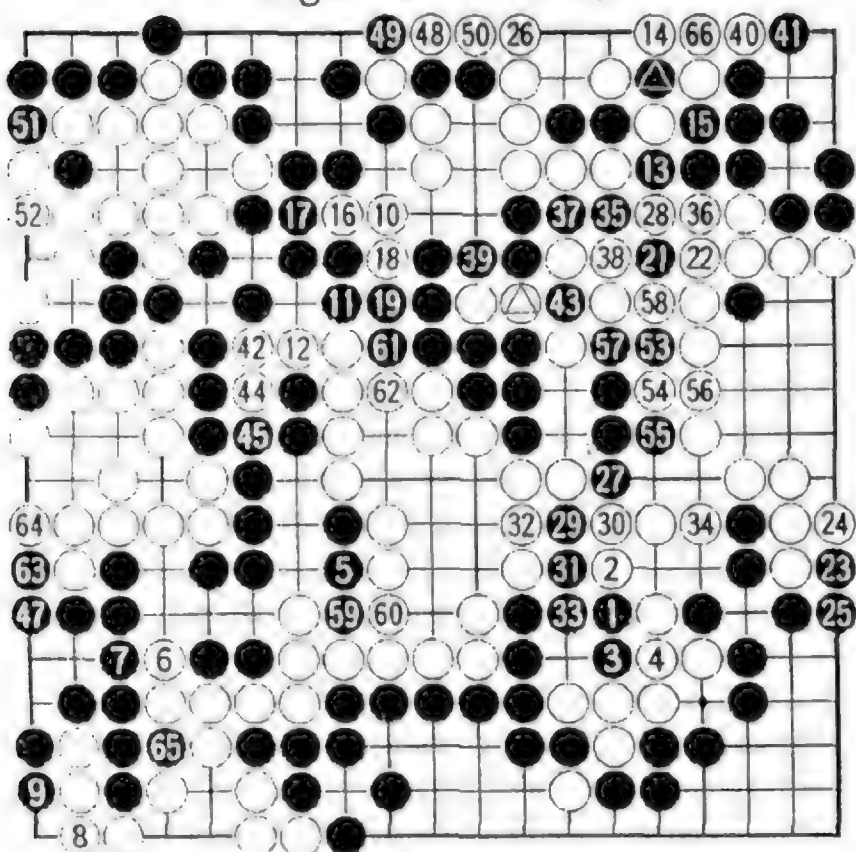


Figure 5 (201–266)

20: connects (the marked black stone)
46: recaptures (the marked white stone)
White wins and connects the *ko*.

Figure 4, Figure 5

Black wins by $3\frac{1}{2}$ points.

28th Throne Title Game Five

To conclude this article, here is a game between Lee and Yoo Chang-hyeok 6-dan. Lee was challenging Yoo, at this time the holder of the Fujitsu Cup, for his sole Korean title. After splitting the first two games, Yoo won the third and fourth, forcing Lee to a *kadoban*. However, Lee fought back to keep his chances alive with a win in this game.

The sixth game was played on 7 June and was won by Yoo, who thus won this title for the third year in a row. For at least one more year he will remain a thorn in the side of the Lee empire.

White: Lee Chang-ho

Black: Yoo Chang-hyeok

Komi: $5\frac{1}{2}$; time: 5 hours each.

Probably played in late May 1994.

Commentary by Kim In 9-dan.

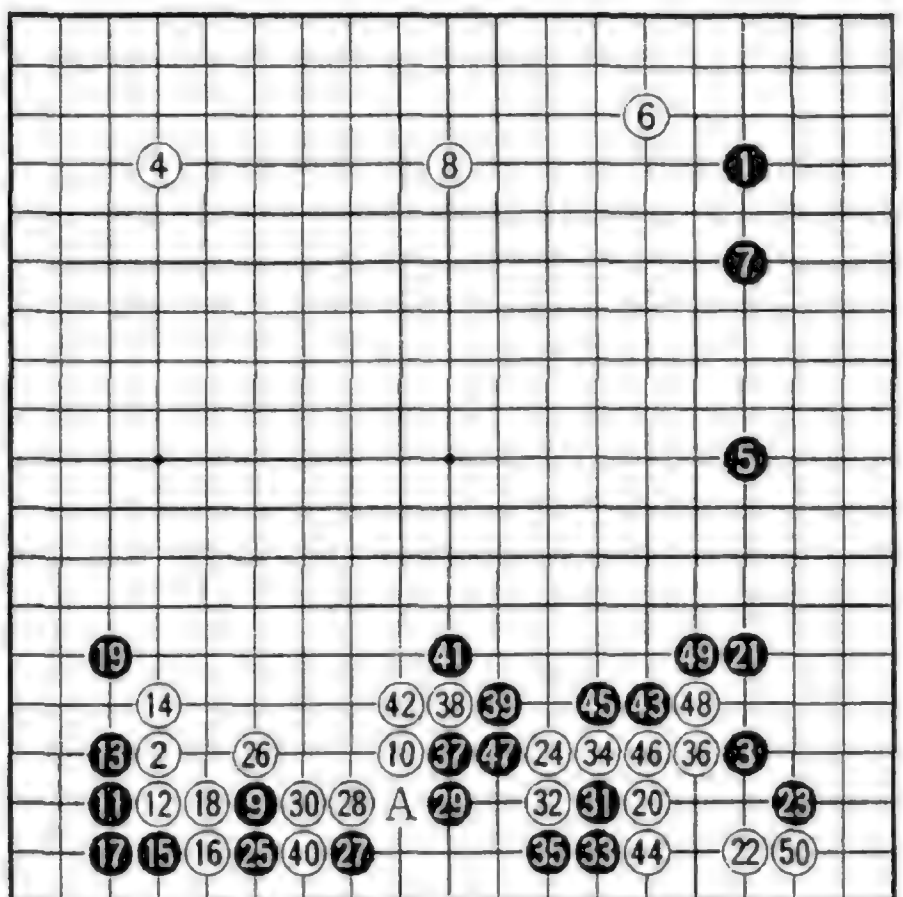


Figure 1 (1–50)

Figure 1 (1–50)

White 30 is strange: he should block at 37. Black 31 is an interesting counter.

Black 39. Playing at A would be most reasonable.

White 40. White should cut at 47.

Figure 2 (51–100)

Black 59. Black should play more aggressively, attacking White with Black A.

Black 71 is probably the losing move. Letting White make shape with 72 to 76 makes the game a tough fight for Black. Instead of 71, Black must extend out with 72.

Reducing with 97 and 99 is not severe enough. Black should challenge White to a fight by cutting at B.

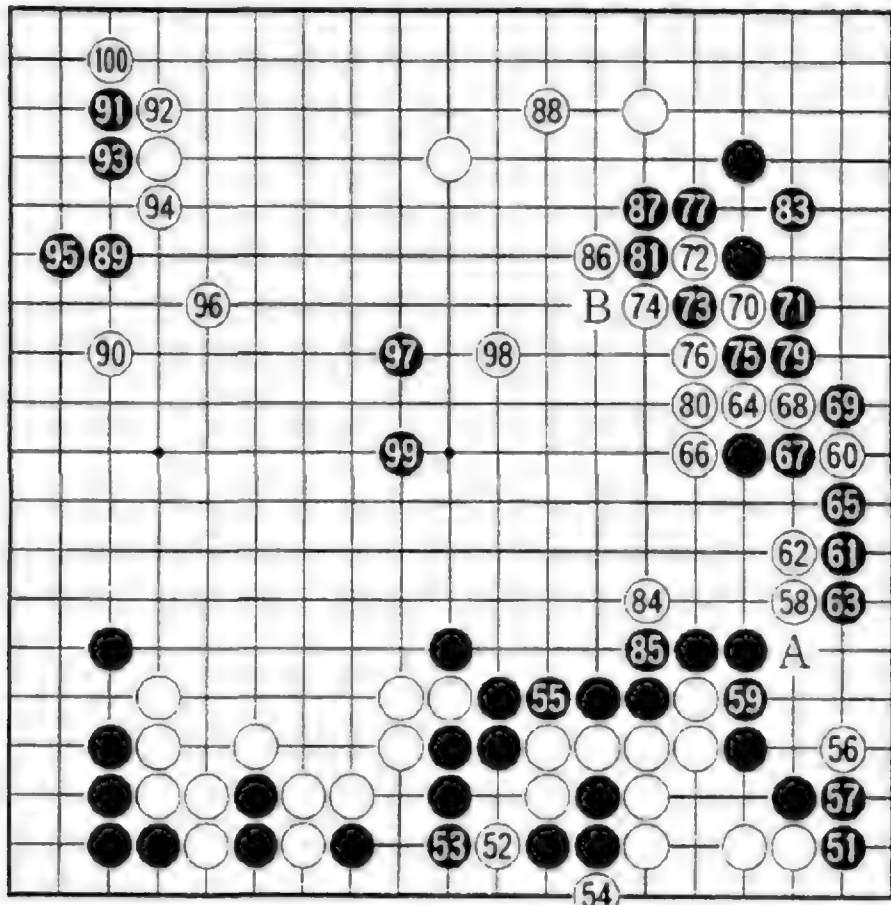


Figure 2 (51–100)

78: ko (at 70); 82: connects (at 73)

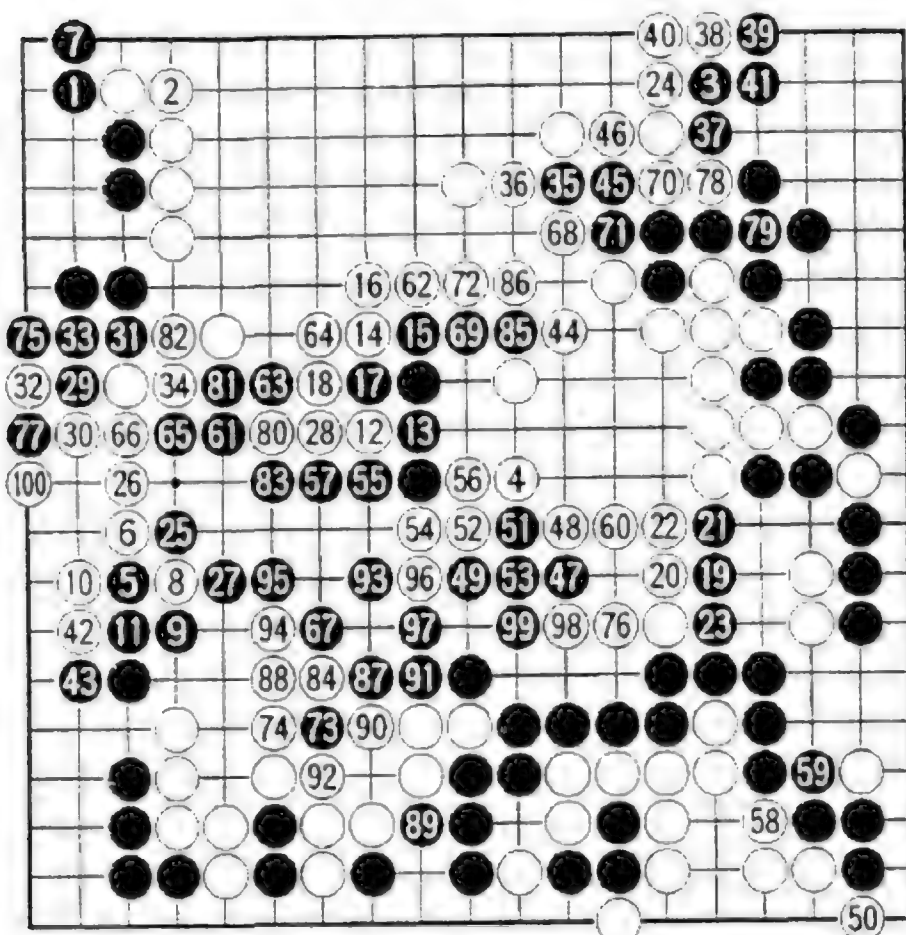


Figure 3 (101–200)

Figure 3 (101–200)

White 4. White is ahead, so he 'drives

safely'.

Black 19 is the largest endgame move. Black continues fighting hard right up to the end, but he can't afford to give the *komi*.

Figure 4 (201–240)

White wins by $3\frac{1}{2}$ points.

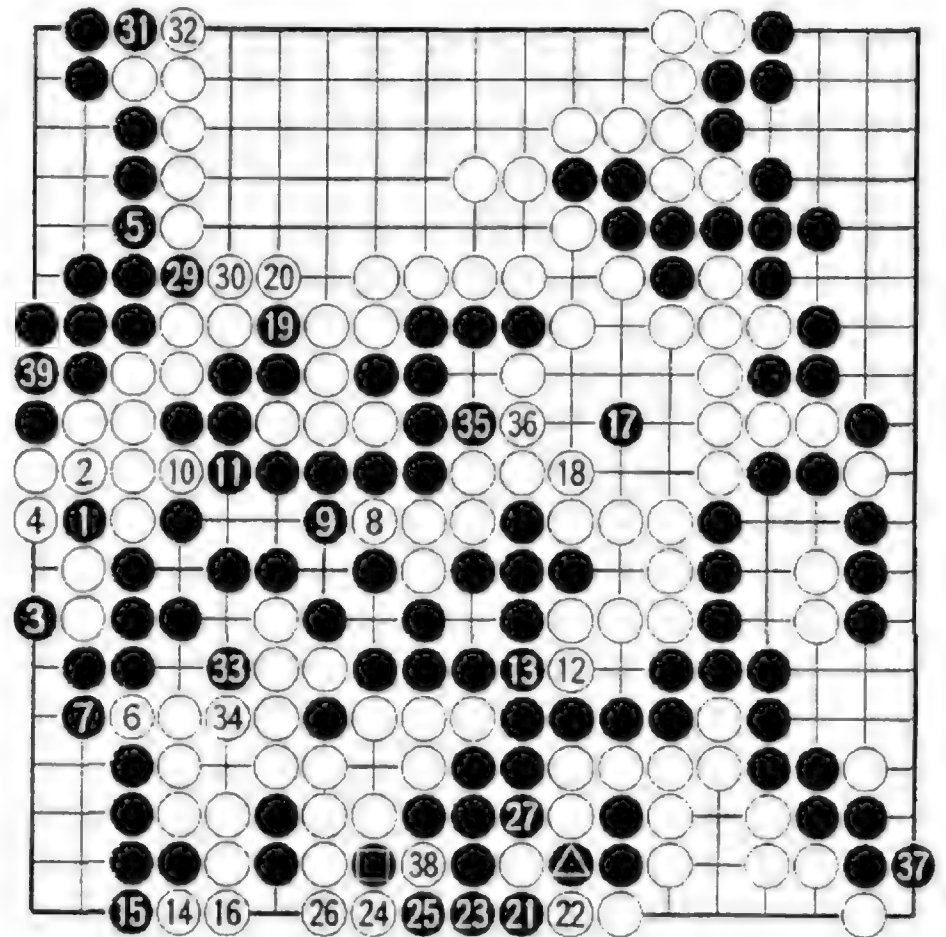


Figure 4 (201–240)

28: connects (triangled stone)

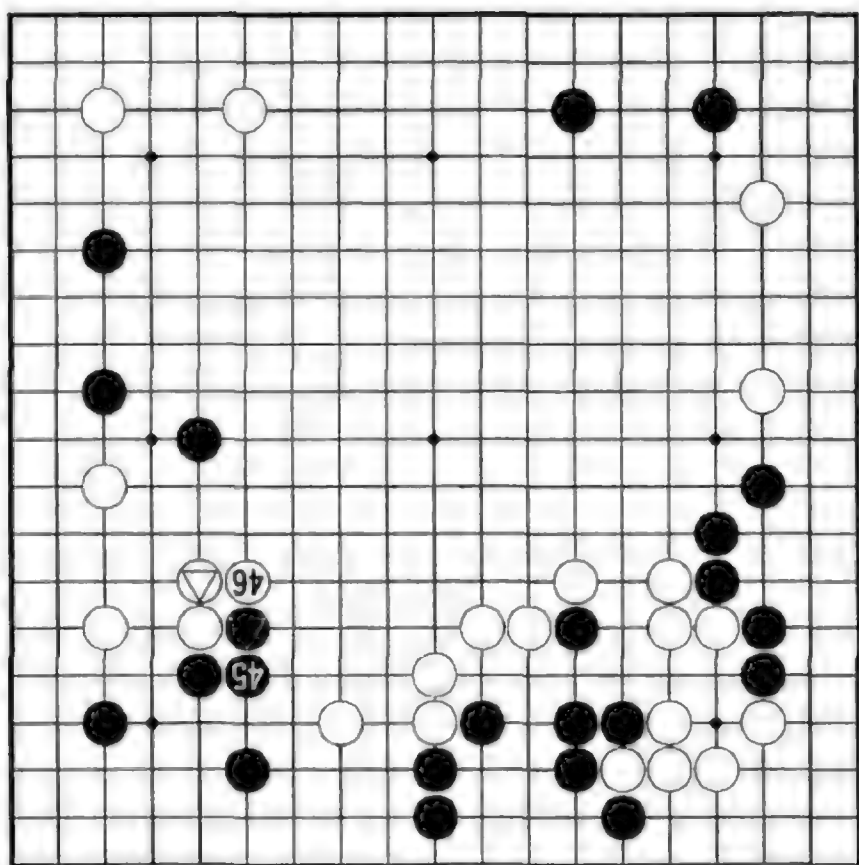
40: connects (squared stone)

Will Lee be drafted?

This is the big question in Korea these days. Lee Chang-ho (who earned promotion to 7-dan recently) is approaching the age at which he will be liable for $2\frac{1}{2}$ years of military service, and a lot of people are worried about the effect this might have on his career — not to mention the question of what happens to the tournament go schedule.

A group of 105 parliamentarians have signed a petition asking for special consideration, but in a country where military service is considered a 'sacred duty', the chances of success are not considered good.

Play Moves with a Purpose



The position above is taken from a game between a professional *shodan* and a top *insei*. The exchange of the marked stones has just been made. Black now connects at 45 and White turns at 46.

These two moves look perfectly natural and, as moves made by a pro and a near-pro, one would take them on trust. Who would give them a second thought when playing through the game record?

The answer to that question is Kobayashi Koichi. 'Both moves are slack,' he said. 'White 46, in particular, is played where one's stones should absolutely never go. It's the move of an amateur.'

Can you guess why Kobayashi Meijin objected to these moves and how he thought Black and White should have played? Hint: he hates moves that work inefficiently. In his eyes, these two moves lack a clearly defined purpose. You could say that the players are on automatic pilot when they should be thinking.

Answers on page 63.

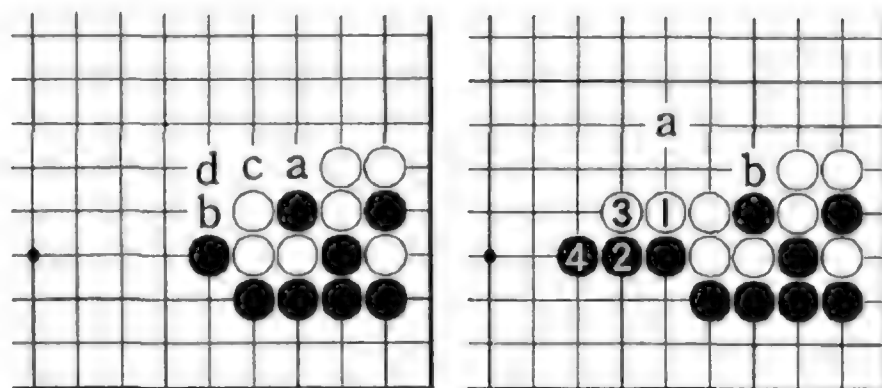
A Taste for Thickness

by Kudo Norio 9-dan

In this issue we present the final two instalments in this series. In Part Five we look at thick defensive moves and in Part Six at examples of thick moves from professional play. We hope that our discussion helps you to acquire a taste for thickness.

5. Proper defensive moves

Defending solidly where you have to defend is what makes it possible to take a leap next. If you play makeshift defensive moves because you don't like taking *gote*, you will find that they handicap you in various ways later. In short, you gain nothing.



Dia. 1: uneasy

Dia. 2: sente but . . .

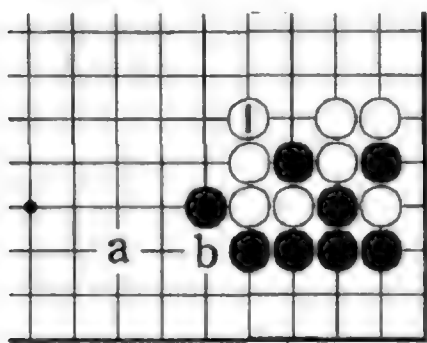
Pattern 1: The right way to capture

Dia. 1. The marked black stone is a thorn in White's side. He not only has to worry about its escaping directly with 'a' but also about Black's building a wall with 'b', White 'c', Black 'd'. If it is White's turn, what is the best way for him to defend against these

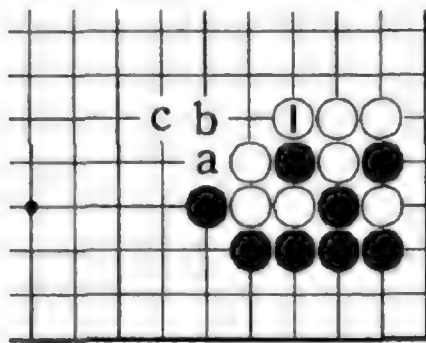
threats?

Dia. 2. Pushing along with 1 and 3 more or less defends against Black's threats. However, White loses a lot by helping Black to secure solid territory; moreover, if Black gets a stone around 'a', the threat of Black 'b' will be revived, so White's apparent *sente* has not gained him much.

Dia. 3. Securing the capture of the stone in good *aji* with 1 is the proper move (*honte*). This makes White thick. He is now the one who has a good follow-up to aim at, that is, White 'a', which threatens to cut at 'b'.



Dia. 3: the honte

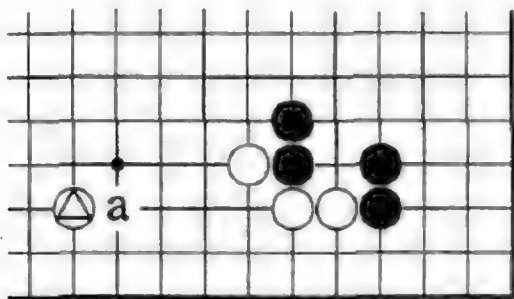


Dia. 4: dubious

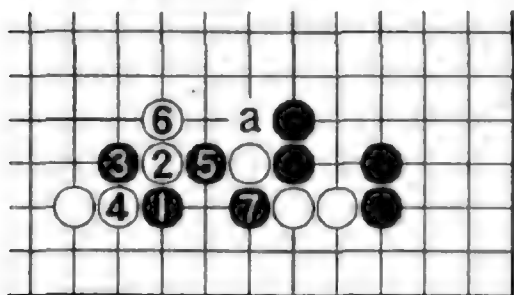
Dia. 4. Taking the stone off the board with 1 may look as if it leaves no worries, but actually Black 'a'–White 'b'–Black 'c' now gives Black nice momentum, so 1 is dubious.

Pattern 2: The weak point of the extension

Dia. 5. In this *joseki* extending to 'a' is the standard move. Playing the marked stone one line wider creates a serious defect in White's position. After first determining what attack Black can make here, think of the best way for White to defend if it is his move.



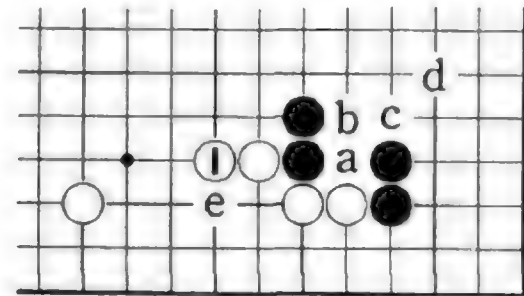
Dia. 5: too wide



Dia. 6: the invasion

Dia. 6. The invasion of 1 puts White on

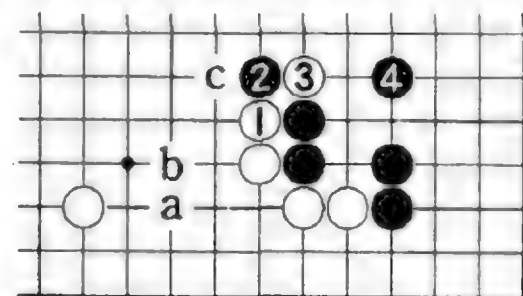
the spot. The shape move is the contact play of 2, but White suffers awful damage when Black counters with 3 to 7. If instead White plays 2 at 'a', Black will jump to 6; with his extension split, White faces a tough fight.



Dia. 7: the honte

Dia. 7. The solid extension of 1 is the best way to defend. Invading has become impossible, and White now has the severe threat of cutting with 'a', Black 'b', White 'c' or of attacking the whole group with White 'd'.

White 1 at 'e' would be too tight and would not effectively influence the centre.



Dia. 8: not sente

Dia. 8. Pushing up at 1 is forceful and looks as if, with luck, it might give one *sente*. However, when Black hanes at 2, one realizes that the threats of Black 'a' and 'b' have not been alleviated at all. One is therefore tempted to cut at 3, only to find after 4 that there is no continuation. In other words, White has just helped Black to strengthen himself without accomplishing the same for himself.

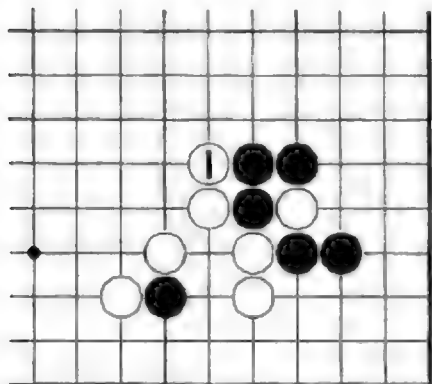
If White uses 3 to *hane* at 'c', Black will connect at 3, and White will have to add another defensive move. This way, also, he can't escape being blamed for helping Black to strengthen himself.

Pattern Three: Playing patiently

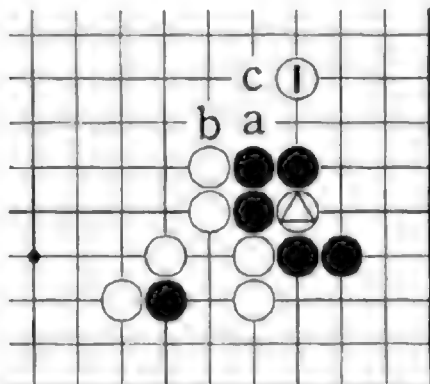
Dia. 9. White 1 is a good example of a thick move. Thanks to this move, White's bottom thickness expands towards the centre. If Black tenukies —

Dia. 10. Attacking with 1 becomes a good

move. With 1 in place, Black has no good way of moving out into the centre: Black 'a' would be an empty triangle, the epitome of bad shape, while either 'b' or 'c' would be cut by White 'a'. In the latter case, one can see that the marked white stone is a shackle hampering Black's freedom of action.

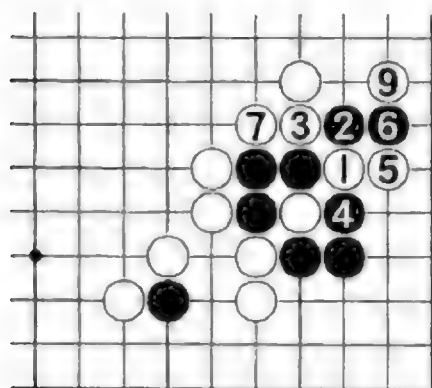


Dia. 9: thick

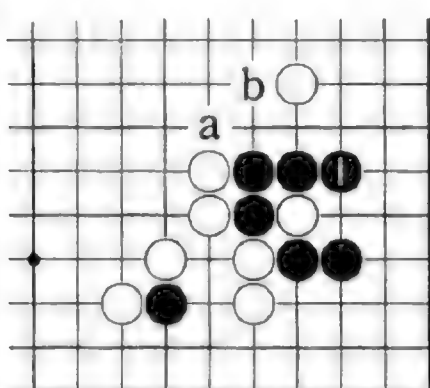


Dia. 10: follow-up

Dia. 11. If Black persists in playing *tenuki*, White can squeeze with the sequence from 1. This would be unbearable. How should Black answer 1 in Dia. 10 then?



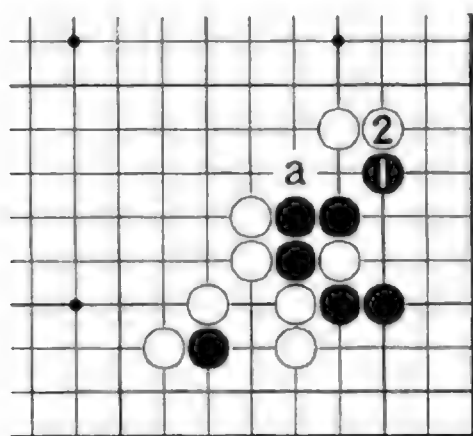
Dia. 11: squeeze
8: connects



Dia. 12: honte

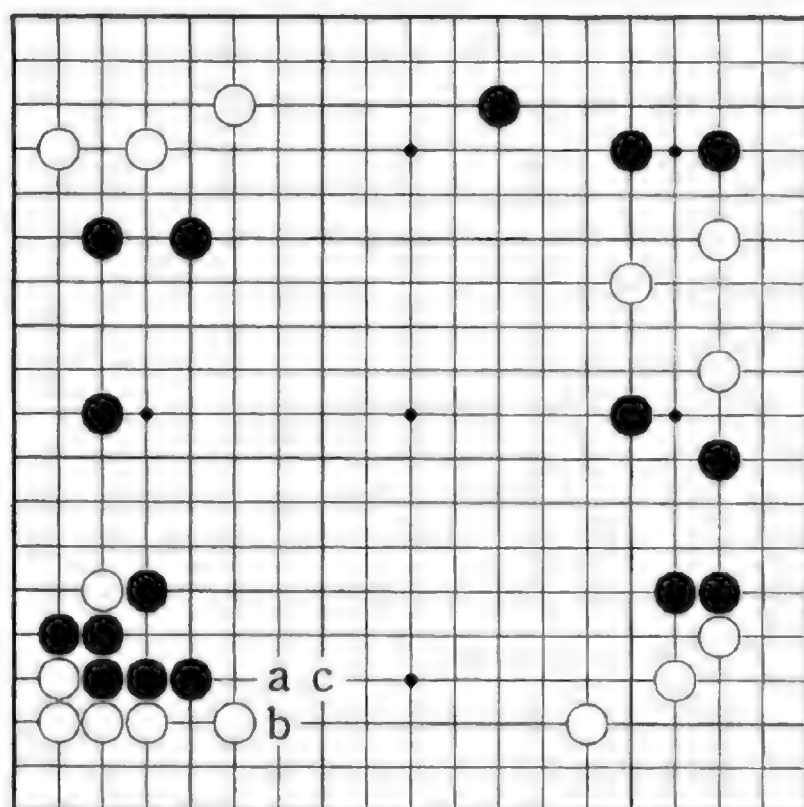
Dia. 12. Descending at 1 makes Black thick. Having secured his foothold, he can now aim at 'a' or 'b'.

Dia. 13. The *kosumi* of 1 is a 'fake' move — the exchange for the solid block of White 2 is bad for Black. As before, the only way for Black to move out is with the bad-shape move of 'a'.



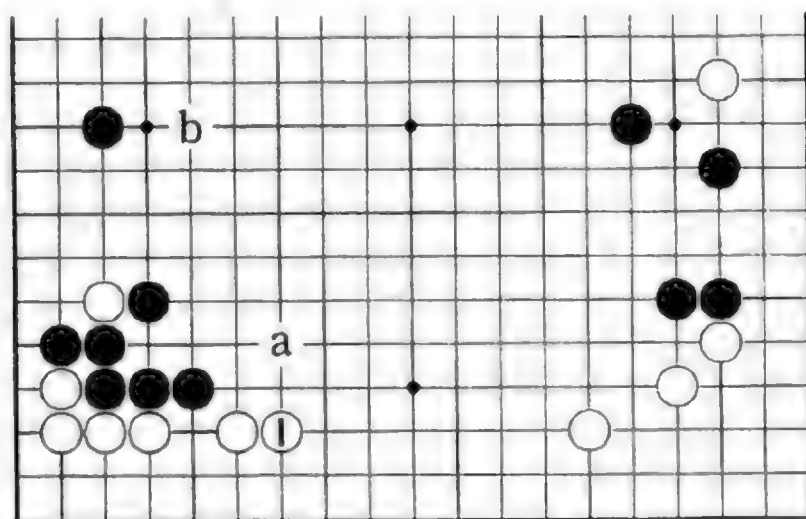
Dia. 13: a fake move

Pattern 4: Answering calmly

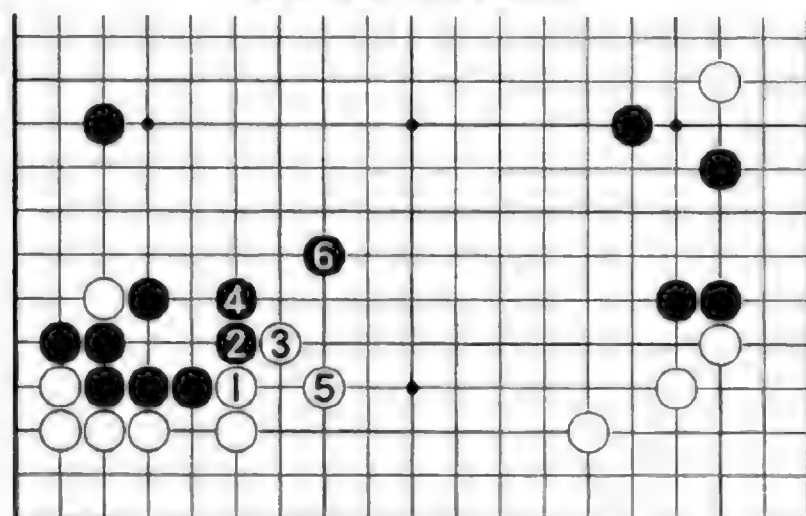


Dia. 14: concerned about the moyo

Dia. 14. This position is from a professional game. White is worried about Black's *moyo* potential on the left side. His immediate concern is that this *moyo* will expand considerably if Black is permitted to play 'a', White 'b', Black 'c'. Forestalling this is White's first priority.



Dia. 15: the honte



Dia. 16: helping Black

Dia. 15. The solid move of 1 is calm and composed. It prevents Black from expanding his *moyo* and at the same time helps to construct a white position at the bottom. If Black

plays 'a', White can reduce his *moyo* with 'b'.

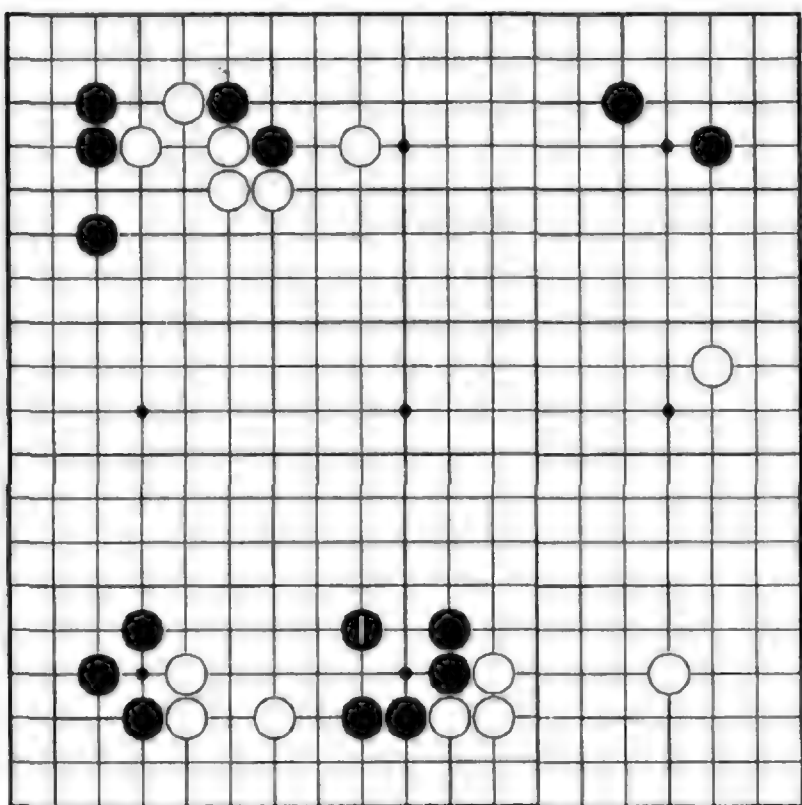
Dia. 16. White may be tempted to push up with 1 and 3, but this helps Black to strengthen his *moyo* with 2 and 4. White has to backtrack at 5, so Black plays 6, making it harder for White to reduce the *moyo*.

6. The Professional Approach

In the final instalment of this series, we look at examples of thick play from professional games. We hope that you can gain some insight into why professionals value thickness so much.

1. Otake-style thickness

The position below comes from a game between Otake Hideo and Iwata Tatsuaki in the 17th Meijin league (played in April 1992).



Dia. 1: Otake-style

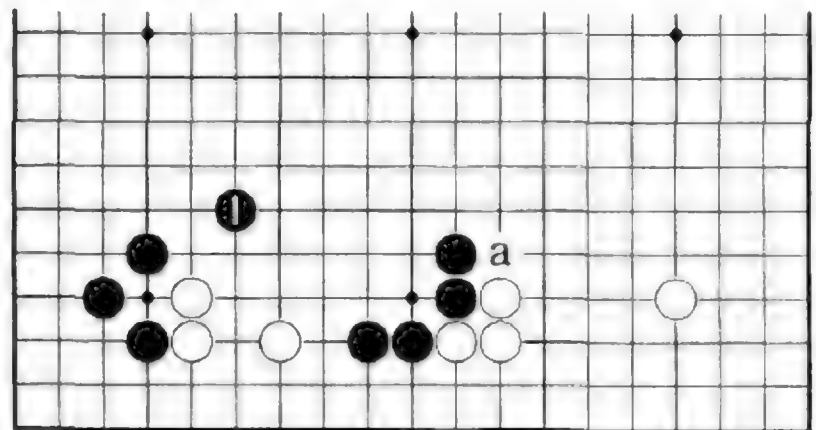
Dia. 1. Otake's Black 1 filled me with admiration. I realize of course that this is the shape move, but with the three white stones being still weak, I would be in no hurry to play 1. My initial impression was that it was a little too calm and composed.

My own go style is to speed ahead, so I can't play calm moves like this. If I were Black —

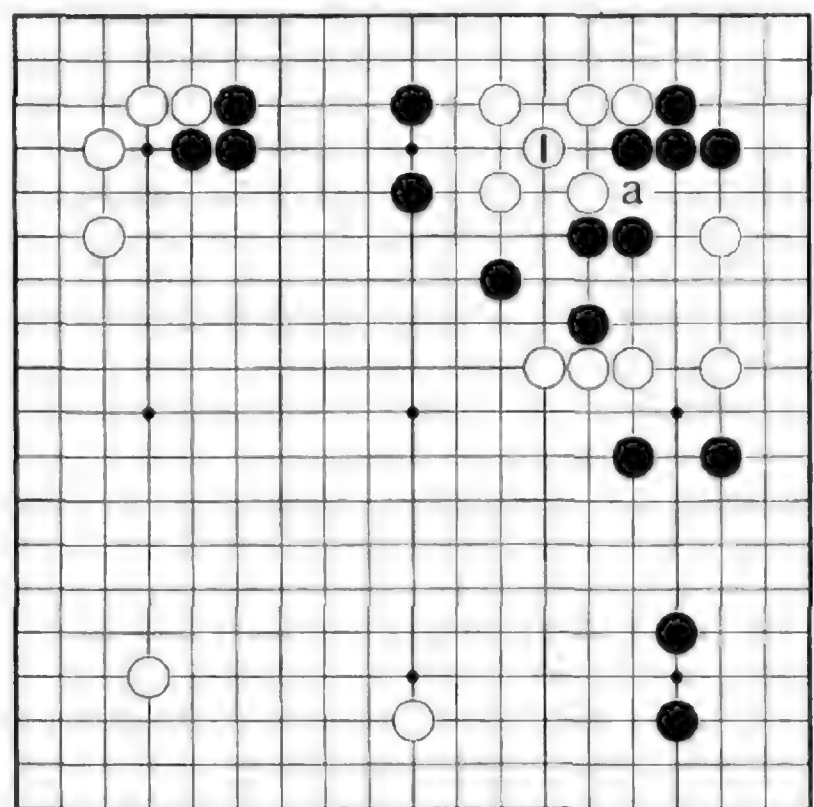
Dia. 2. I would either launch a pre-emptive attack with 1 or turn at 'a'. Both these moves look severe.

In contrast, Black 1 in *Dia. 1* first defends Black's own position and asks the opponent,

'Well, what are you going to do now?' Instead of trying to take the initiative, Black places the onus on White to decide the course of play. Black will follow behind, ready to pounce if he falters. This is a cunning strategy. The more you look at it, the more you realize the profound implications of Otake's move.



Dia. 2: Kudo-style



Dia. 3: Yamashiro's surprise

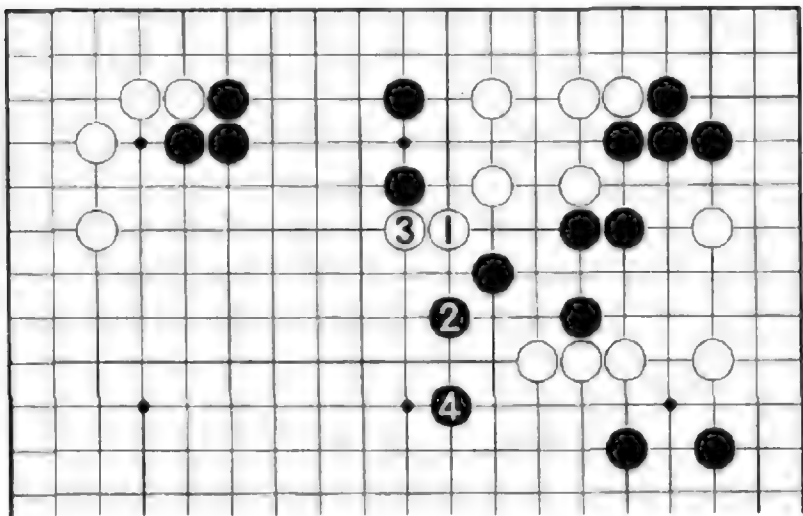
2. Yamashiro's 'slow' move

Dia. 3. I was astonished by White 1, played by Yamashiro 9-dan in the 1992 Kisei title match. Not only would I never play a move like this, if by some chance it came into my head, I'd discard it from fear of having my professional colleagues laugh at me for playing *dame* points. It takes courage to play an unconventional move like this.

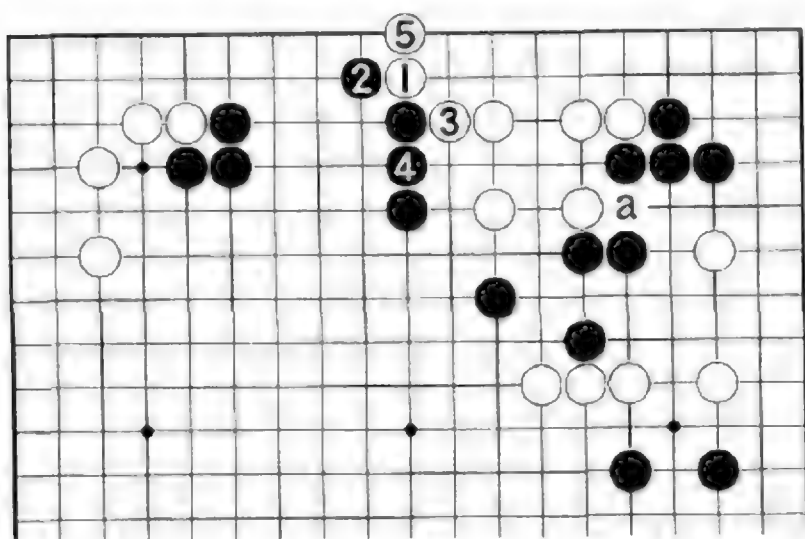
However, White 1 was a good move. Because of it, the white group is more or less alive, and White can aim at 'a', which is a major threat.

Dia. 4. Poking one's head out with 1 is the move everyone would think of. However,

when Black plays 2 and 4, you realize that White is fleeing aimlessly, without increasing his eye potential.



Dia. 4: conventional



Dia. 5: crude

Dia. 5. White can secure definite eye shape by playing 1 to 5, but these moves help Black to solidify his group. Moreover, White can't hope to aim at 'a'. This is a crude strategy.

3. Shuko-style thickness

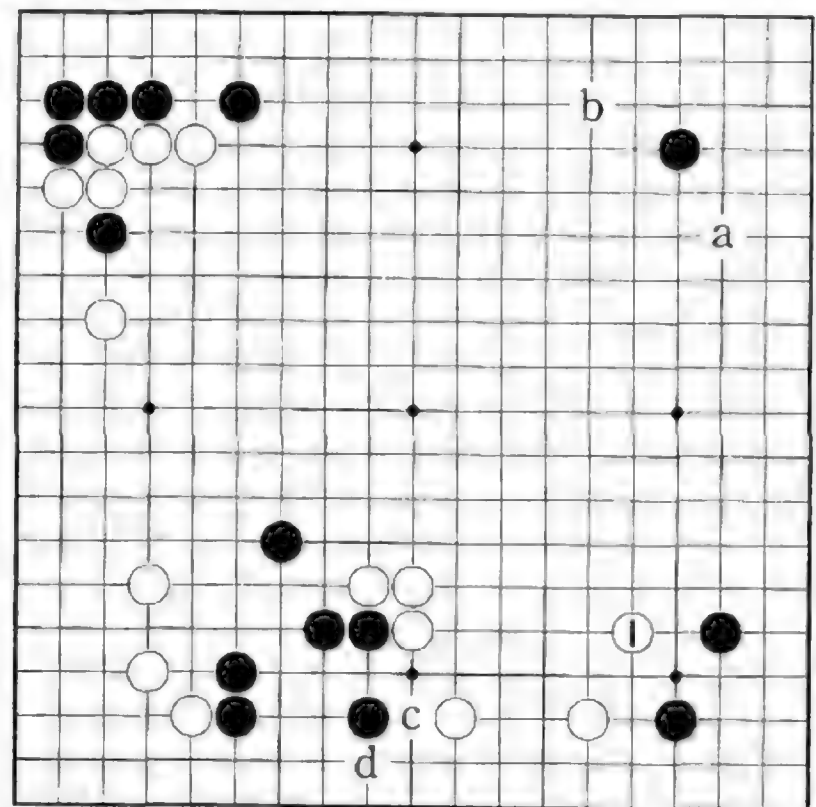
Dia. 6. Fujisawa Shuko Oza played White 1 in the 1992 Oza title match. This is a thick move that everyone can understand.

Even so, why does White play a move like 1 when there are still big *fuseki* points (*oba*) like 'a' and 'b'? Even if White lets Black jump to 1, he has no need to worry, as at any time he can exchange White 'c' for Black 'd'.

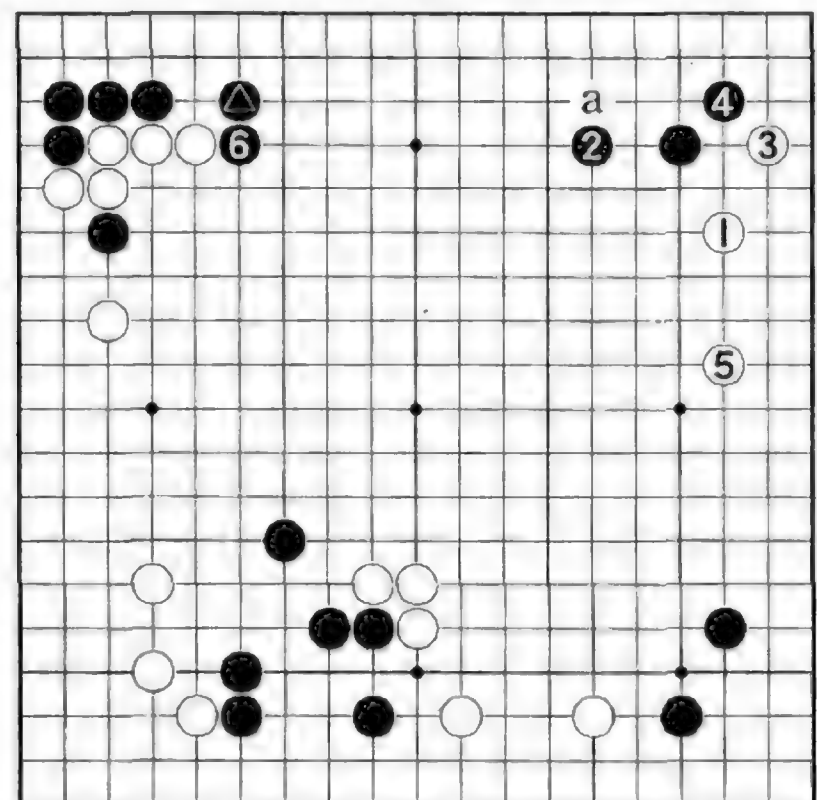
Dia. 7. Let's try switching to the approach move of 1. If the ordinary sequence to 5 follows, then pushing up at 6 becomes a good move for Black. That's an important point. It's the reason White is not so keen to play at 1.

If instead White plays at 'a', Black will defend the corner. If White then extends

along the top, he finds that Black has already poked his head out with the marked stone, limiting White's potential there.



Dia. 6: the biggest move



Dia. 7: drawback of the approach move

We can thus see that neither approach move is very appealing. In contrast, White 1 in Dia. 6 has merits like building up a *moyo* and limiting Black's potential development from his corner enclosure, so it becomes a bigger move than 'a' and 'b'.

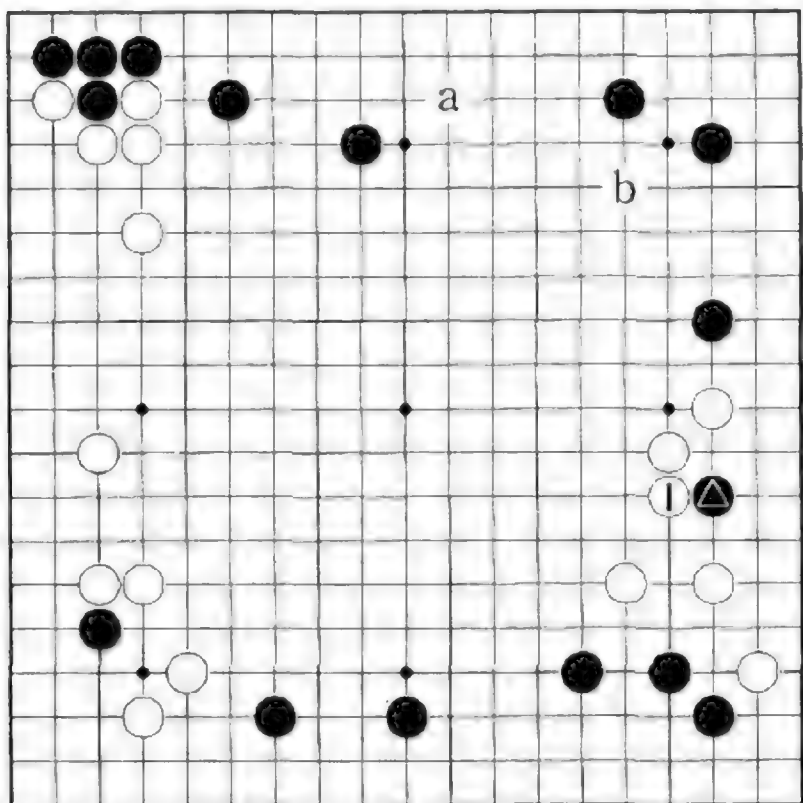
However, I'm not asking you to admire this move just because Shuko played it. Since it's hard to find other big points, I think most professionals would play it.

4. Rin's solid defence

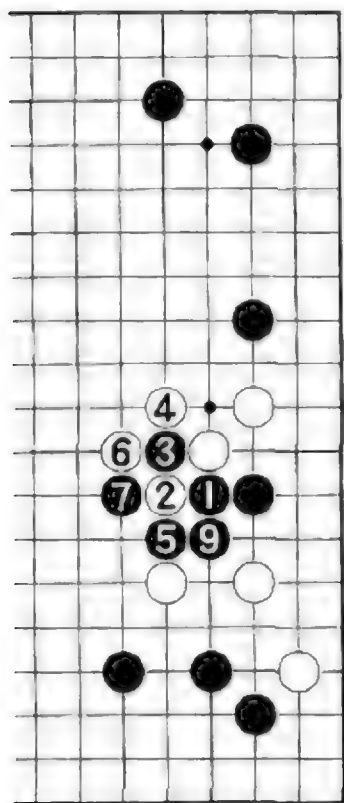
Dia. 8. White 1 is a solid move Rin Kaiho

played several years ago in the Oza title. White was the then title-holder Kato Masao.

This area had been left alone for a while, but with the game entering the middle game, the *aji* of the marked stone becomes worrying. If White does nothing —

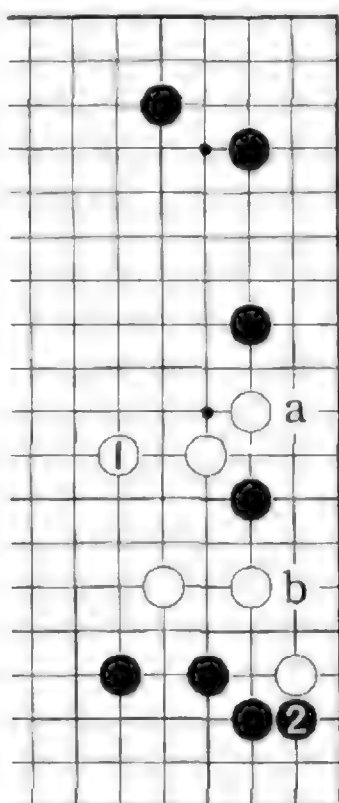


Dia. 8: defending solidly



Dia. 9
8: connects

Dia. 9. Black might move out with 1 and 3 at any time. If White 4, Black captures three stones, which is a big loss, yet if White plays 4 at 7, Black will extend at 4, putting a lot of pressure on the two white stones he cuts off. In a game like this, in which Black has built a *moyo* extending from the top right corner along the top, White doesn't want to let Black make thickness that will help him at the top.



Dia. 10

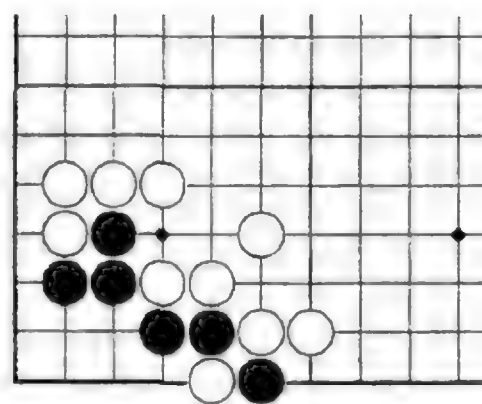
White could have used 1 in *Dia. 8* to reduce the top with 'a' or 'b', but he probably didn't like the prospect of Black's going ahead with *Dia. 9*.

Rin is known as a territorial player, but he defends when he has to. In this position, most professionals would play 1 in *Dia. 8*.

Dia. 10. Being greedy with a move like White 1 is not recommended. This is a fake move. Later, when Black blocks at 2, he will be able to use the *aji* of 'a' to attach at 'b'. White will regret having played 1.

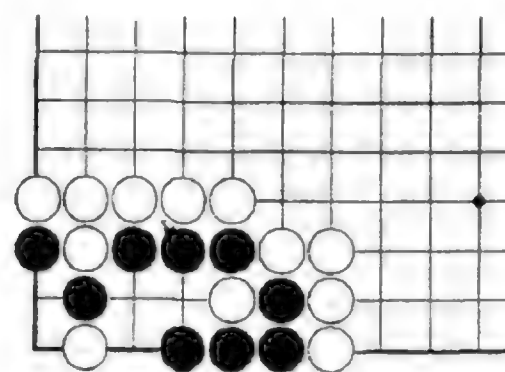
(Kido, November & December, 1992)

Life and Death Problems



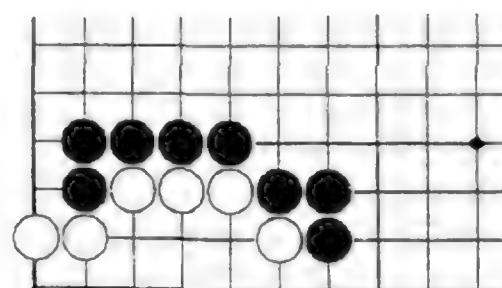
1. Black to play and live

The 2-1 point is the vital point in the corner, according to the proverb, but can you trust it?



2. Black to get a ko

Only one move avoids dying unconditionally.



3. Black to kill White
Answers on page 64

Play Moves with a Purpose: Answers

The answers to the two problems are to be found in the brief commentary below. White was Kurotaki Masaki 1-dan, age 17 and the younger brother of Masanori 4-dan. Black was Rin Shien, an *insei*. They were playing in a special tournament sponsored by *Go Weekly* that pitted *insei* against young professionals. Rin, age 15, is from Taiwan (his name is spelt Lin Ziyuan in Chinese) and is a disciple of Rin Kaiho. He beat two professionals, making the third round, before losing. This game is from the second round.

White: Kurotaki Masaki 1-dan

Black: Rin Shien

No komi

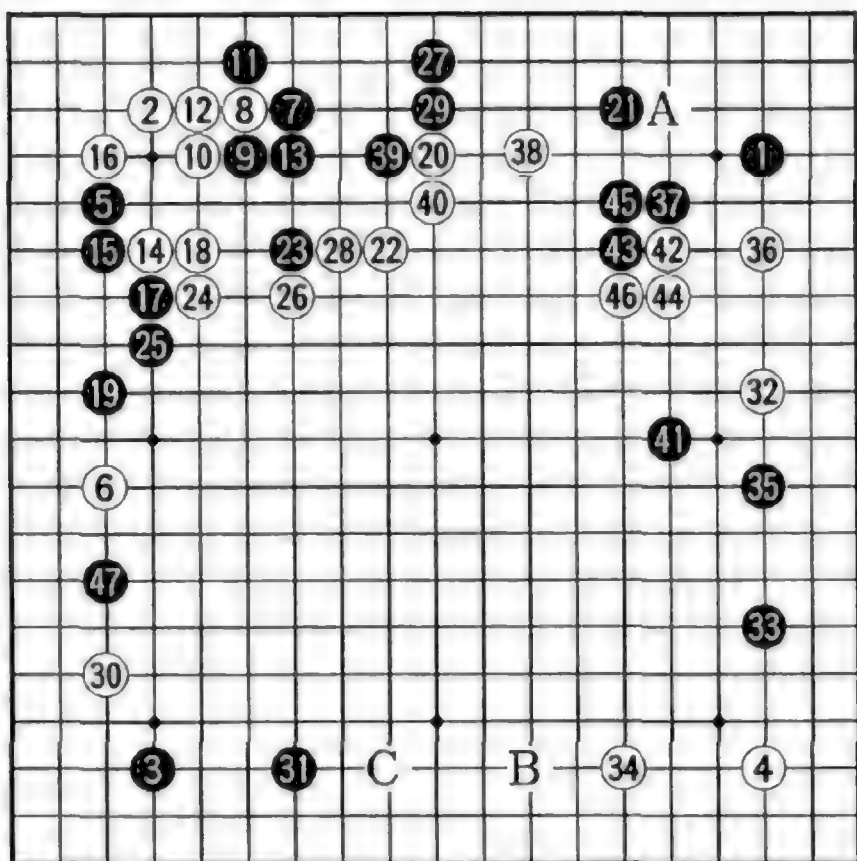


Figure (1-47)

Figure 1 (1-47)

Kobayashi: 'Black 21 is a good enclosure. Answering White 20 would only give White the chance to switch to A.' Being sealed in at the top may look bad for Black, but he gains from the exchange of 24 for 25.

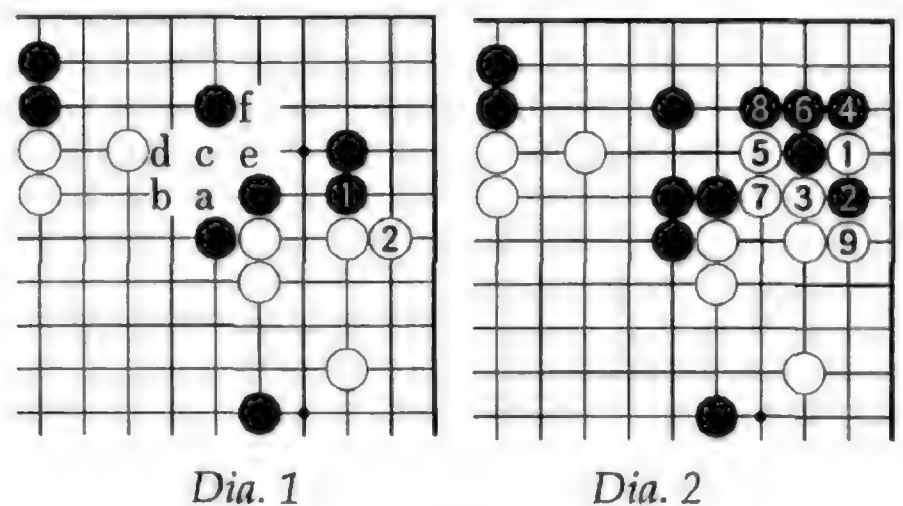
Answering 38 by taking *sente* with 39 and switching to 41 is shrewd. For that reason, White 38 seems to be dubious.

Kobayashi had been praising Black's play, but his face clouded when he saw Black 45 and White 46 and he made the comn

comments quoted earlier.

Kobayashi: 'Black should use 45 to take *sente* with 1 in *Dia. 1*, then switch to B in the figure. White's cut at 'a' is no problem: Black answers with 'b' through 'f'. White 46 just makes thickness for the sake of thickness. If White is going to play something here, he should attach at 1 in *Dia. 2*; up to 9, he flattens out Black's position and gets an excellent result. That's why Black 1 in *Dia. 1* was urgent. An alternative strategy is to switch 46 to C in the figure. That's what I might play. The white group on the top right is not going to die even if White tenukies.'

The game is going well for Black when he plunges in at 47.



Dia. 1

Dia. 2

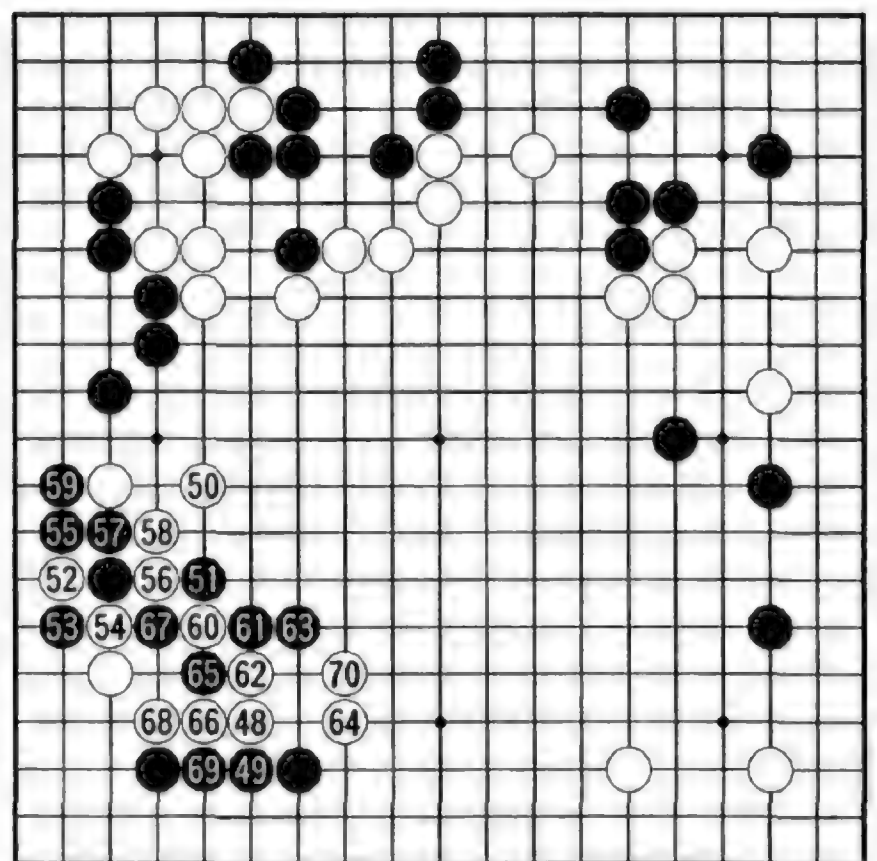
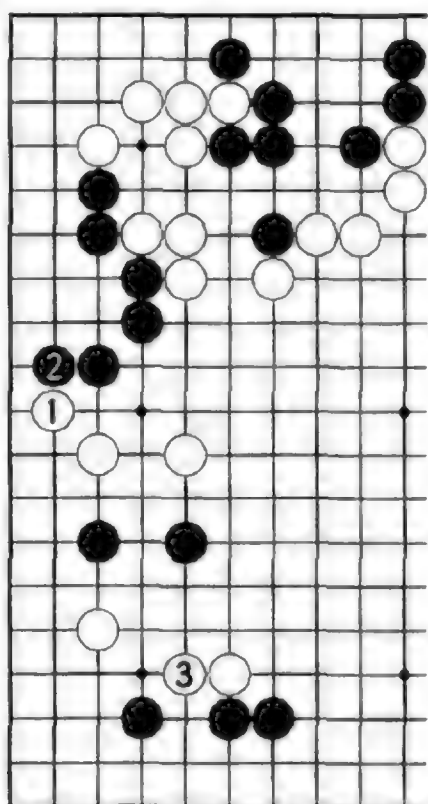


Figure 2 (48-70)

Figure 2 (48-70)

Kobayashi's severe comments on White's play continued. 'What kind of a move is 52? Black gratefully accepts the feast with 53 —

the game is already lost for White. This is not the place for White to seek *sabaki*; at any rate, I'd like to have seen him fight with 1 and 3 in *Dia. 3*. If White had played like this, it would have been no easy matter for Black to clinch a win.'



Dia. 3

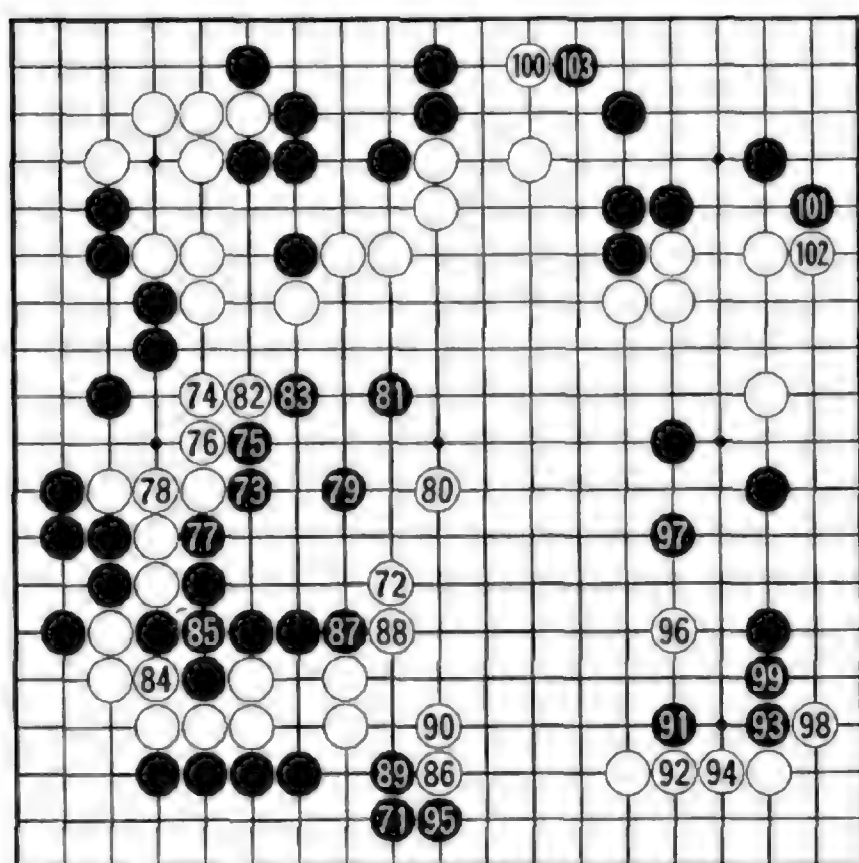


Figure 3 (71-103)

Figure 3 (71-103)

Kobayashi had no more comments on the game after 52. Except for 45, this was a good game for the *insei*.

It's interesting to see how far a *shodan* is from meeting the exacting standards of a top player. Of course, most of us would be happy to make the mistakes of a *shodan* professional — if we could make his good moves too — so in that sense presenting

those two dubious moves as problems may have been unrealistic. However, we felt that the way Kobayashi cut to the core of the problem was instructive, so we hope this short article inspires the reader to take a second look at some of the moves he takes for granted in his own game.

Moves after 103 omitted. White resigns.

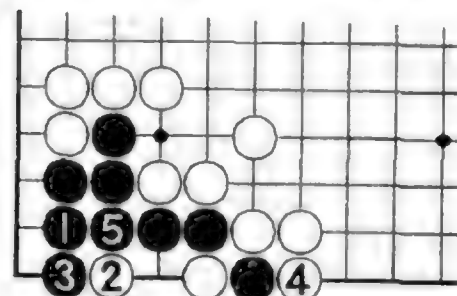
(Go Weekly, 21 June 1994)

Life and Death Problems: Answers

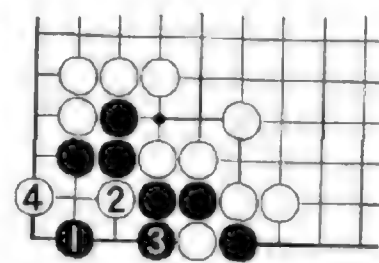
Answer to Problem 1

Dia. 1. Black 1 is the only way to live. White 2 is the strongest counter, but Black 3 guarantees two eyes.

Dia. 2. Black 2 might look like correct shape, but White has no trouble killing Black with the 2-4 combination. In this case, the proverb is misleading.



Dia. 1: alive

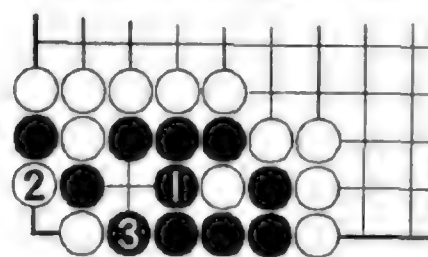


Dia. 2: dead

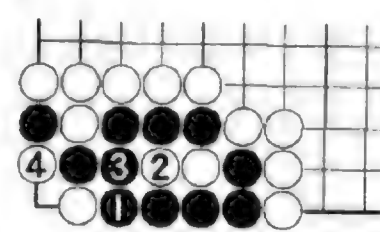
Answer to Problem 2

Dia. 1. Quietly capturing a stone with 1 is the only resistance Black can offer. Everything else dies outright.

Dia. 2. If Black 1, the group dies.



Dia. 1: ko

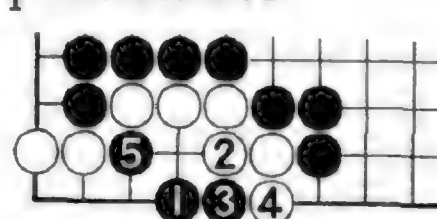


Dia. 2: dead

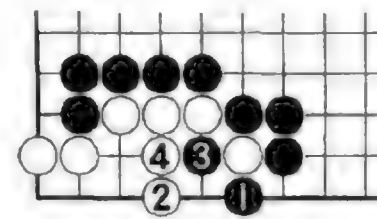
Answer to Problem 3

Dia. 1. Play at the centre of three stones, says the proverb, and this time you can trust it. Crawling once at 3 is the key.

Dia. 2. Black 1 lets White take the vital point and live.



Dia. 1: dead



Dia. 2: alive

(Igo Club, June 1992)

Where Is the "\$1,000 Ko"?

Elwyn Berlekamp and Yonghoan Kim

In this problem, it is White's turn to move. Play will proceed according to the Ing rules, as recommended by the American Go Association in February 1994. There is no komi. Both sides have the same number of captives when the problem begins.

Figure 1: Starting Position of Problems 1 and 2

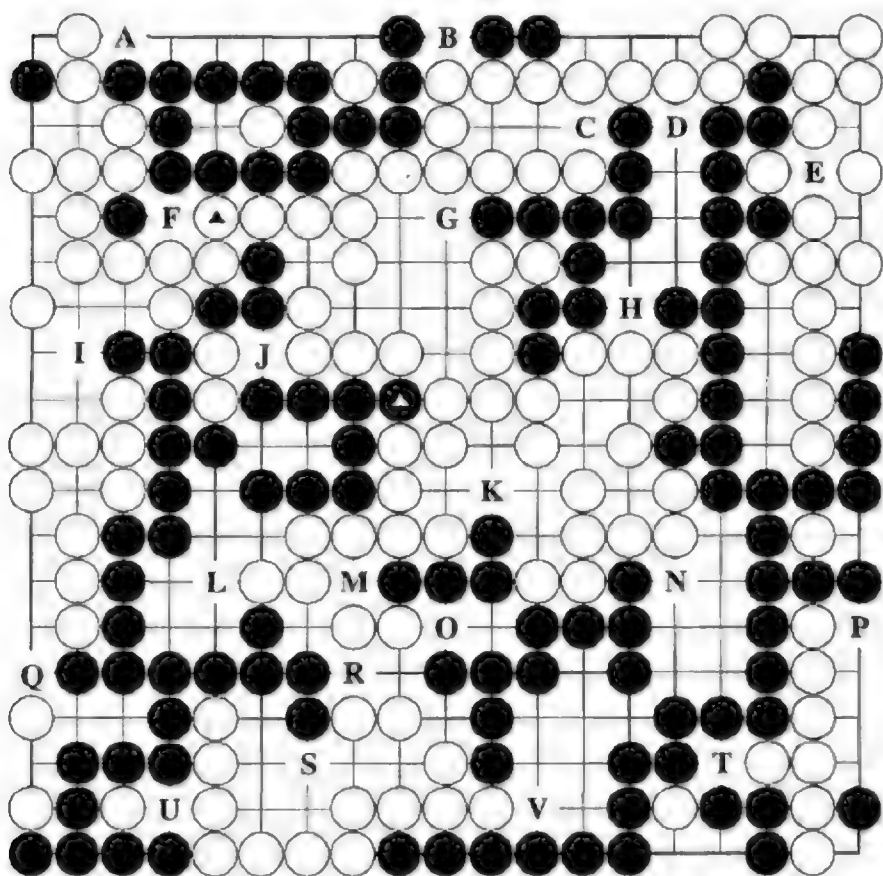
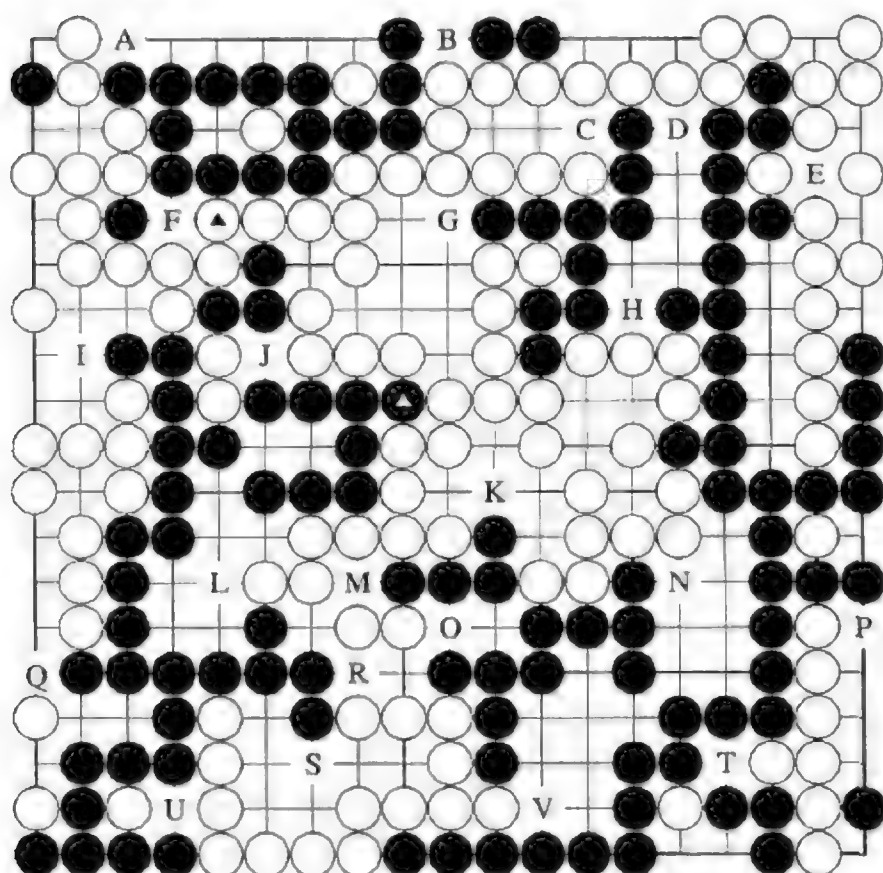


Figure 2: Starting Position of Problems 3 and 4



We now actually solve four separate problems. In Problem 1 of Figure 1, both marked stones are absent and in Problem 2, they are present. Does it matter? Problem 3 (with two marked stones absent) and Problem 4 (with two marked stones present) are shown in Figure 2. There is only one small difference between the two figures:

the White stone located a knight's move south southwest of E in Figure 1 is moved to a knight's move east southeast of R in Figure 2.

Problem 3 appeared on the inside cover of *Go World* issue 70.

In each case, assume that the winner collects a prize of \$1000. If he wins by more than one point, he can keep the entire amount, but if he wins by only one point, he is required to pay the loser \$1 per move. How long will each game last?

SUMMARY OF THE SOLUTIONS

We think that White wins Problem 1 by one point but Black wins Problem 2 by one point.

Despite an enormous number of possible lines of play, the assertions which suggest that conclusion are all proved mathematically, without computers. Surprisingly little read-ahead or searching is required.

For the first 53 moves, the canonical play of both problems is identical. At move 7, White must play a nominally smaller move in order to reduce the number of Black kothreats. Black begins the ko at the point marked "E" on move 12. But then, even though White has enough kothreats to win the ko, he must decline to fight it! Black fills the ko on move 14.

The ko located near the point marked "E" in Figure 1 is the only ko which is clearly visible in the problem statements shown in Figure 1. It became mistakenly known as the "Thousand Dollar Ko". It was difficult enough to stump all of the contestants in a recent contest sponsored by Ishi Press, International.

After all moves whose unchilled mathematical temperature exceeds one point (or equivalently, "two points in gote") have been played, there is an interesting and non-trivial contest on the regions which chill to infinitesimals. Using methods described in the book, "Mathematical Go", White has a straight-forward win in Japanese scoring. However, under the Ing rules, one of the regions can assume a slightly different value because of a potential small Chinese ko. Black must play under the assumption that he can win this ko. This ko, which is difficult to foresee, is the real "Thousand Dollar Ko". It begins to affect the play soon after the first 20 moves of either problem.

The players next play the regions which chill to numbers (or, in Go jargon, moves worth "less than two points in gote"). Because each dame can play a decisive role in the forthcoming Chinese kofight, this subsequence of play requires considerable care.

Under Japanese scoring, the game ends at move 53 with a one-point win for White. This is true in every version of the original problem.

Move 54 marks the beginning of final preparations for the decisive thousand dollar kofight, which is *not* located near "E". Beginning at move 56, optimal play of Problem 1 and Problem 2 diverge significantly. In Problem 2, Black attacks White's kothreats and wins most quickly by removing as many of them as she can before the kofight begins. But in the Problem 1, which Black cannot win, she prolongs the game by creating more kothreats of her own. White can then win only by starting the ko surprisingly early, while many nominally "removable" kothreats still remain on the board.

MATHEMATICAL MODELLING

The philosophy which we follow is common in applied mathematics. We begin by making various assumptions which simplify the problem to one that is more easily modelled mathematically. Then we solve the mathematical problem, using whatever simplifying approximations and assumptions seem reasonable and convenient. Finally, after we have obtained the solution to the idealized problem, we verify that this solution is sufficiently robust to remain valid when the simplifications that were made to get there are all removed. The final process of "verification of robustness" can also be viewed as "picking away the nits".

CHILLED VALUES

The mathematical solution of our two problems begins by determining the chilled value of each nontrivial position in each region of the board, appropriately marked, subject to the assumption that all unmarked stones sufficiently far away from the relevant letter are "safely alive" or "immortal". These chilled values are shown in Table 1.

Most of these values can be found by looking them up in Appendix E (or, perhaps more easily, in the equivalent directory on pages 71-76) of the book "Mathematical Go", which we hereafter refer to as "MG".

Many of these values include specific infinitesimals, whose notations and properties are described in MG. Occasionally, when the precise value of some infinitesimal is unnecessarily cumbersome, we simply call it "ish", which is the common abbreviation for "Infinitesimally Shifted". This now-common abbreviation was introduced long ago by John Conway, the discoverer of the theory of Partizan Games.

Values must also be computed for those regions which do not appear verbatim in the book. Such calculations are done as described in Chapter 2 of MG. As an example of such a calculation, we consider the region

Table 1: Chilled Value and Incentives of Each Region:

	Chilled Value	Δ^L	Δ^R
A	$0^3 \mid \dagger$	$\neg \mid 0^3$	$\{0^3 \mid \dagger\} \{- \mid 0^2\}$
B	$1\frac{3}{4} \mid -2$	$3\frac{3}{4} \mid 0$	Δ^L
C	$-\frac{1}{4}$	$-\frac{1}{4}$	Δ^L
DH	$\frac{1}{8}$	$\frac{1}{8}$	Δ^L
E	$ko[1, 0]$		
F	*	*	Δ^L
G	$\{\frac{5}{8} \parallel \neg_{1/2} \mid 0\} \mid -2$	$2\frac{5}{8} \mid 2\{-_{1/2} \mid 0\} \parallel 0$	Δ^L
G^L	$\frac{5}{8} \parallel \neg \mid 0$	$\frac{5}{8} \{0 \mid \dagger\} \mid 0$	Δ^L
I	$1 \mid -\frac{1}{2}$	$1\frac{1}{2} \mid 0$	Δ^L
J	$4 \mid -5$	$9 \mid 0$	Δ^L
K	$0 \mid -\frac{1}{2}$	$\frac{1}{2} \mid 0$	Δ^L
L	$\frac{5}{4} \mid -\frac{1}{2}$	$1\frac{3}{4} \mid 0$	Δ^L
$M[S^L]$	θ		
N	$0 \mid \dagger \parallel -\frac{7}{8} \mid -1$	$\{1 \mid \frac{7}{8}\} \{0 \mid \dagger\} \parallel 0$	Δ^L
N^R	$-\frac{7}{8} \mid -1$	$\frac{1}{8} \mid 0$	Δ^L
O	$\approx \dagger_{13}$	$\approx \neg_{13}$	$\approx \{13 \mid 0\} \dagger_{13}$
P	$\{12 - \theta\} \mid \{-12 + \theta\}$	$\approx 24 \mid 0$	Δ^L
Q	$2ish \mid -2\downarrow*$	$4ish \mid 0$	Δ^L
$R[S^L]$	θ		
S	$\{\frac{1}{2} + \theta\theta\} \mid -1\Downarrow*$	$1\frac{1}{2}\theta\theta\Uparrow* \mid 0$	Δ^L
T	$\approx \dagger_6$	$\approx \neg_6$	$\approx \{6 \mid 0\} \dagger_6$
U	*	*	Δ^L
V	$2 \parallel \mid 0 \mid \dagger_1 \parallel -1*$	$3* \mid 2\{-1 \mid 0\} \parallel 0$	Δ^L
V^R	$0 \mid \dagger \parallel -1*$	$1*\{0 \mid \dagger\} \mid 0$	Δ^L

$Q, Q = \{Q^L \mid Q^R\}$, where Q^R is the position after White has played there and Q^L is the position after black has played there. After appropriate changes of markings (which affects only the integer parts of the relative score), we may continue as follows:

$$\begin{array}{c}
 \begin{array}{c} \text{Diagram of a Go board position with stones and markings} \end{array} = \left\{ \begin{array}{c} \text{Diagram 1} \\ \text{Diagram 2} \end{array} \mid \begin{array}{c} \text{Diagram 3} \\ \text{Diagram 4} \end{array} \right\} \\
 Q^R = \{ \quad 0 \quad , \quad \neg \quad \mid \quad * \quad , \quad \neg \quad \}
 \end{array}$$

Although 0 and $\neg$ are both formal Black followers of Q^R , the miny option is dominated and we have

$$Q^R = \{0 \mid *, \neg\}.$$

The two formal White followers are * and $\neg$, which are incomparable. However, White's move from Q^R to $\neg$ reverses through a hot position to 0 and we have the canonical form,

$$Q^R = \{0 \mid *, 0\} = \downarrow*.$$

To compute Q^L , we begin with the standard assumption that "sufficiently distant stones are safely alive", which in this case suggests that we assume White has already played from I twice to reach I^{RR} . In that environment, it is easily seen that, after an appropriate adjustment of markings, $Q^{LLL} = \neg$ and $Q^L = \neg \mid 0^2$. We then obtain the value of

$$Q = 2\{- \mid 0^2\} \mid -2\downarrow*.$$

Other values shown in Table 1 are computed by similar calculations.

In general, values of games may be conveniently partitioned into three sets: cold, tepid and hot. Cold values are numbers. In Table 1, the regions with cold values are **DH** and **C**. Tepid values are infinitesimally close to numbers. In Table 1, tepid values are **A**, **F**, **M**, **O**, **T**, and **U**. The other values shown in Table 1 are hot. In general, hot moves, tepid moves and cold moves should be played in that order. So, to determine the first phase of play, we will need to determine the order to play the hot moves in Table 1.

INCENTIVES

As explained in Section 5.5 of **MG**, a useful way to compare different choices of moves is to compute their incentives. In general, the game,

$$Z = \{Z^L \mid Z^R\},$$

has a set of Left incentives of the form

$$\Delta^L(Z) = Z^L - Z$$

where there are as many Left incentives as there are Left followers, Z^L . Similarly, the Right incentives of this game have the form

$$\Delta^R(Z) = Z - Z^R.$$

Calculations of canonical incentives often require considerable attention to mathematical detail. For example, consider a generic 3-stop game,

$$G = \{x \parallel y \mid z\}$$

where x , y and z are numbers with $x > y > z$. Then

$$\begin{aligned} \Delta^L(G) &= G^L - G \\ &= x - \{x \parallel y \mid z\} \\ &= x + \{-z \mid -y \parallel -x\} \\ &= \{x - z \mid x - y \parallel 0\} \end{aligned}$$

by the **Number Translation Theorem** on page 48 of **MG**. But

$$\begin{aligned} \Delta^R(G) &= G - G^R \\ &= \{x \parallel y \mid z\} + \{-z \mid -y\} \\ &= \{\{x - z \mid x - y\}, \{x - z \parallel y - z \mid 0\} \\ &\quad \mid 0, \{x - y \parallel 0 \mid z - y\}\}. \end{aligned}$$

Deleting Right's dominated option gives

$$\Delta^R(G) = \{\{x - z \mid x - y\}, \{x - z \parallel y - z \mid 0\} \mid 0\}.$$

The second Left option is dominated if

$$x - y \geq \{y - z \mid 0\}$$

or equivalently, if $x - y \geq y - z$, or if $x + z \geq 2y$. In that case,

$$\Delta^R(G) = \Delta^L(G).$$

However, if $x - y < y - z$, then

$$\Delta^R(G) > \Delta^L(G).$$

Furthermore, if $2(x - y) < y - z$, then

$$t(\Delta^R G) > t(\Delta^L G),$$

where t means the temperature.

Most of the positions shown in Table 1 have a single canonical Left incentive and a single canonical Right incentive. Although these two are often formally different, further calculation often reveals their values to be equal. In Table 1, this happens on all rows except **A**, **E**, **M**, **O**, **R**, and **T**.

If Black plays from **S** to **S^L**, he converts each of the regions **M** and **R** into a Black kothreat. Although each of these kothreats has a mathematical value of zero, it can, of course, be used to affect the outcome of the ko. We denote each such kothreat by the Greek letter θ . Typographically, θ looks somewhat like "0", as it should. The pronunciation of this letter also begins with the same sound as "THreat". Similarly, a White kothreat can be denoted by $-\theta$.

Incentives are games. Just like any pair of games, a pair of incentives may be comparable or incomparable. Fortunately, it happens that most pairs of incentives shown in

Table 2: Sorted Incentives and the Dominant Lines of Hot Play

	Δ	I	II	III	IV	V
P	$\approx 24 \mid 0$	1	1	1	1	1
J	$\approx 9 \mid 0$	2	2	2	2	2
Q	$4ish \mid 0$	3	3	3	3	3
B	$3\frac{3}{4} \mid 0$	4	4	4	4	4
V	$3* \mid 2\{-1 \mid 0\} \parallel 0$	5	5	5	5	5
G	$2\frac{5}{8} \mid 2\{-1/2 \mid 0\} \parallel 0$	6	6	6	6	6
L	$1\frac{3}{4} \mid 0$	8	8	8	7(?)	7(?)
I	$1\frac{1}{2} \mid 0$	9	9	9	9	9
V^R	$1*\{0 \mid \dagger\} \mid 0$	10	10	10	10	10
N	$\{1 \mid \frac{7}{8}\}\{0 \mid \dagger\} \parallel 0$	11	11	11	11	12
G^L	$\frac{5}{8}\{0 \mid \dagger\} \mid 0$	13	22	12(?)	13	13
K	$\frac{1}{2} \mid 0$	15	24	13	14	14
N^R	$\frac{1}{8} \mid 0$	16	25	24	31	-
S	$1\frac{1}{2}\theta\theta\uparrow* \mid 0$	7	7	7	8	8
E	ko	12	12	14	12	-
E^L	$-ko$	-	-	-	15	-
$R[S^L]$	$\Delta\theta$	-	-	-	16	-
E	ko	-	-	-	18	-
T	$-\Delta\theta$	-	13(?)	15	19	-
E^L	$-ko$	-	15	17	21	-
P^R	$\Delta\theta$	-	16	18	22	-
E	ko	-	18	20	24	-
O	$-\Delta\theta$	-	19	21	25	-
E^L	$-ko$	-	21	23	27	-
$M[S^L]$	$\Delta\theta$	-	-	-	28	-
E	ko	-	-	-	30	-
E^L	$-ko$	-	-	-	-	-
kofill		14	23	25	32	11
Totals		0	$0 \mid \dagger$	$-\frac{3}{8}ish$	$\frac{1}{8}ish$	$\frac{1}{8}ish$

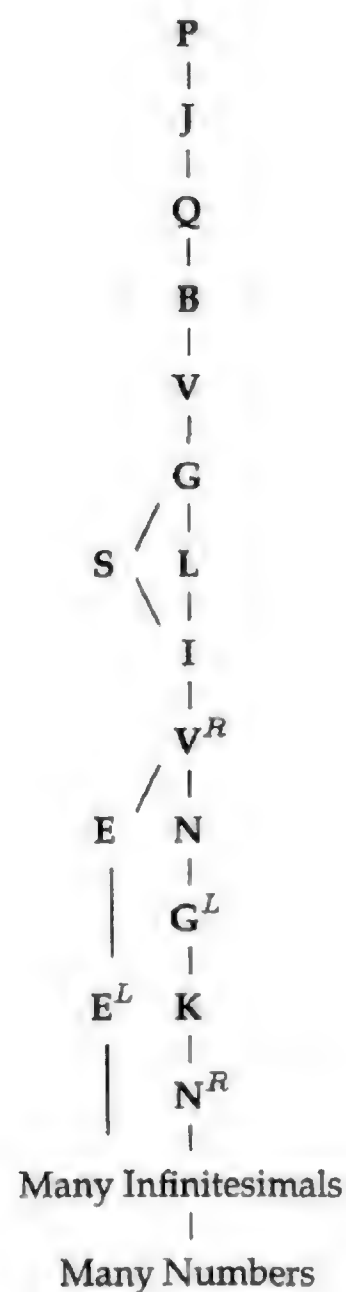


Table 1 are comparable. Except for a possible infinitesimal error in one case, (another “nit” that will be picked away much later), the incentives can be conveniently ordered as shown in Table 2. The top portion of this table shows the positions P, J, Q, ..., N^R , each of which has a unique incentive, which is the same for both Left and Right and which is greater-ish than the incentives of all positions listed below it and less-ish than incentives of all positions listed above it.

Notice that some positions with nonzero values, such as minies or tinies, may also serve as kothreats for Black or White, respectively. Although their *values* are infinitesimal or zero, tinies, minies and θ 's of either sign, all of them have hot *incentives* for at least one player and so we will need to include them in our studies of “hot” moves.

Either player will always prefer to play a move with maximum incentive. So, (ignoring a potential infinitesimal nit) each player will prefer to play on P, J, Q, B, ... in the

order listed in the top portion of Table 2. Regions of Table 1 which have no hot incentives are omitted from Table 2.

There are some hot moves which cannot be so easily fit into the ordering in the top portion of Table 2. These include the ko at E, potential White kothreats at T and O, potential Black kothreats at P^R , $R[S^L]$ and $M[S^L]$ and the position at S, whose play creates or destroys two Black kothreats. These moves are listed in the bottom portion of Table 2, in the order in which they are expected to be played: S will be played before the ko; once the kofight starts, kothreats will alternate; and finally someone will eventually fill the ko.

Good play must somehow intersperse the ordered set of moves shown at the bottom of Table 2 into the ordered set shown at the top. In order to do this, it is very helpful to consider the *pseudo-incentives* of E and S.

PSEUDO-INCENTIVES RELATED TO THE KO AT E

Suppose that we have a set of games $A, B, C, \dots, K$ with ordered incentives, $\Delta A > \Delta B > \Delta C, \dots, > \Delta K$. Suppose also that there is a kofight in progress and that White has 6 more kothreats, namely, $-\theta[6], -\theta[5], \dots, -\theta[1]$. Then a competently played game will continue as follows:

B	ko	1	7	...	25	31
W	$-\theta$	2:[6]	8:[5]	...	26:[2]	32:[1]
B	$-\theta^R$	3	9	...	27	33
W	ko	4	10	...	28	34
B		5:A	11:C	...	29:I	35:K
W		6:B	12:D	...	30:J	36

Notice that White declines to fill the ko at moves 6, 12, 18, 24 or 30. He eventually fills the ko at move 36, because he has no more kothreats. In the above situation, if X is any canonical value such that $X = \Delta X$ and that $\Delta K > \Delta X > \Delta L$, then we may treat the ko as if its value were X . Such treatment gives the correct time at which Right will fill

the ko. And both ko and X contribute the same amount to the outcome of the game, since $ko^R = X^R = 0$. For these reasons, we write $ko \equiv X$ and we say that the ko has a *pseudo-incentive*, $\Delta^R(ko) = \Delta(X)$.

This viewpoint is especially helpful when we can predict an appropriate value of X from global considerations. Suppose, for example that E, the ko in this problem, appears in an environment containing a few pairs of games with incentives between $\{1|0\}$ and $\{0|0\}$, more White kothreats and even more infinitesimals. Then we claim that

$$(ko)^R = 0ish, (ko)^L = \{1|0\}ish,$$

$$\Delta^R(ko) = 0ish, \Delta^L(ko) = \{1|0\}ish.$$

Left begins fighting the ko as soon as she has no more moves of incentive $\{1|0\}ish$ or greater. Right eventually fills the ko when he runs out of kothreats, which happens during the play of infinitesimals.

In the present problem, there are at least 2 and at most 4 moves with incentives between $\{1|0\}ish$ and $0ish$: N, G^L, K and N^R . There are many potentially tepid moves, on games such as $A, F, G^{LR}, N^L, Q^R, S^R$ and U, V^{RL} . So, if there are 2 net White kothreats, then $E \equiv 0ish$. Similarly, if there are 2 net Black kothreats, then $E^L \equiv 1ish$ and $E \equiv \{1|0\}ish$. In either case, we obtain a useful bound on the *pseudo-incentives* of E, namely,

$$\Delta E \leq \{1|0\}ish.$$

This allows us to assume that canonical players prefer to play on V^Rish rather than on E.

A continuation of this argument allows us to obtain an upper bound on the incentive of $(S+E)$.

Let $Z = \{S^L + \theta | S^R - \theta\}$. Then, if Z is played by Left, there are 2 net Black kothreats and $E \equiv \{1|0\}ish$, but if Z is played by Right, there are 2 net White kothreats and $E \equiv 0ish$. So,

$$\begin{aligned} \Delta(Z + E) &= \Delta(\{1\frac{1}{2} | \frac{1}{2} || -1\}ish) \\ &= \{2\frac{1}{2} | 1\frac{1}{2} || 0\}. \end{aligned}$$

Since Z is always played before E , $\Delta(Z + E) = \Delta(Z)$ and since kothreats are at worst harmless, we have the following bounds on *pseudo-incentives*:

$$\Delta S < \Delta Z < \{2\frac{1}{2} \mid 1\frac{1}{2} \parallel 0\}.$$

We may now obtain bounds on the incentive of $S = \{\frac{1}{2} \mid -1\}$ ish. Since Black kothreats can not harm Black, we have

$$\Delta S \geq \Delta(\frac{1}{2} \mid -1) = \{1\frac{1}{2} \mid 0\}.$$

So,

$$\{2\frac{1}{2} \mid 1\frac{1}{2} \parallel 0\} \geq \Delta S \geq \{1\frac{1}{2} \mid 0\}.$$

THE SEARCH

Using the bounds on the *pseudo-incentives* of S and E , we obtain the partial ordering shown at the right of Table 2. Using this partial ordering, canonical players face only two choices:

- 1) whether to play S before or after L and
- 2) how to play the ko at E

In each column of Table 2, the entries show the move numbers on which that row is played.

The choice between S and L occurs at move 7. The dominant continuations following 7S appear in columns I, II and III; the dominant continuations following 7L appear in columns IV and V. But both players may need to decide when to play their first move at E or E^L . After 7L, White later chooses between 11E(column V) and 11N(column IV). After 7S, White clearly does better not to fill a ko which he can win later, so he plays 11N and Black may then choose between 12G^L(column III) and 12E(column I and II). After 12E, White can still choose either to fight the ko with 13T(column II) or not(column I).

We assert that the canonical solution is column I, which corresponds to the game played in Figure 3.

The bottom row of Table 2 shows the total value of the outcome of each line of play, *relative to the line of play shown in column I*. Each of these values can be easily computed, using only the information shown in Table 1. For example, to compare the outcome of column III with the outcome of column I, we tally the rows where the entries have different parities. In row G^L, White (odd numbers) played in column I, but Black (even numbers) played in column III and so that row's contribution to the difference is

$$(G^L)^L - (G^L)^R = 2\Delta(G^L) = \frac{5}{8}ish$$

The only other row which contributes any difference is the *kofill*. The raw (warmed) difference in scores depending on who eventually fills the ko at E is 4 points (one for the stone captured in the ko itself, and three points of white territory along the top right edge of the board). But there is also a difference of three moves and so the chilled value of this ko is 1 point. Thus, the "kofill" line contributes -1 point to the total. Then the bottom line of column III is obtained as

$$\frac{5}{8}ish - 1 = -\frac{3}{8}ish.$$

The calculation of the bottom line for column V is only slightly more subtle:

$$\begin{array}{rcl} -2\Delta(L) & = & -1\frac{3}{4} \\ +2\Delta(N) & = & \{1 \mid \frac{7}{8}\}ish \\ +2\Delta(K) & = & +\frac{1}{2} \\ -1\Delta(N^R) & = & \{0 \mid -\frac{1}{8}\} \\ +2\Delta(S) & = & +1\frac{1}{2}ish \\ \text{kofill} & = & -1 \\ \hline \text{Relative Total} & = & +\frac{1}{8}ish \end{array}$$

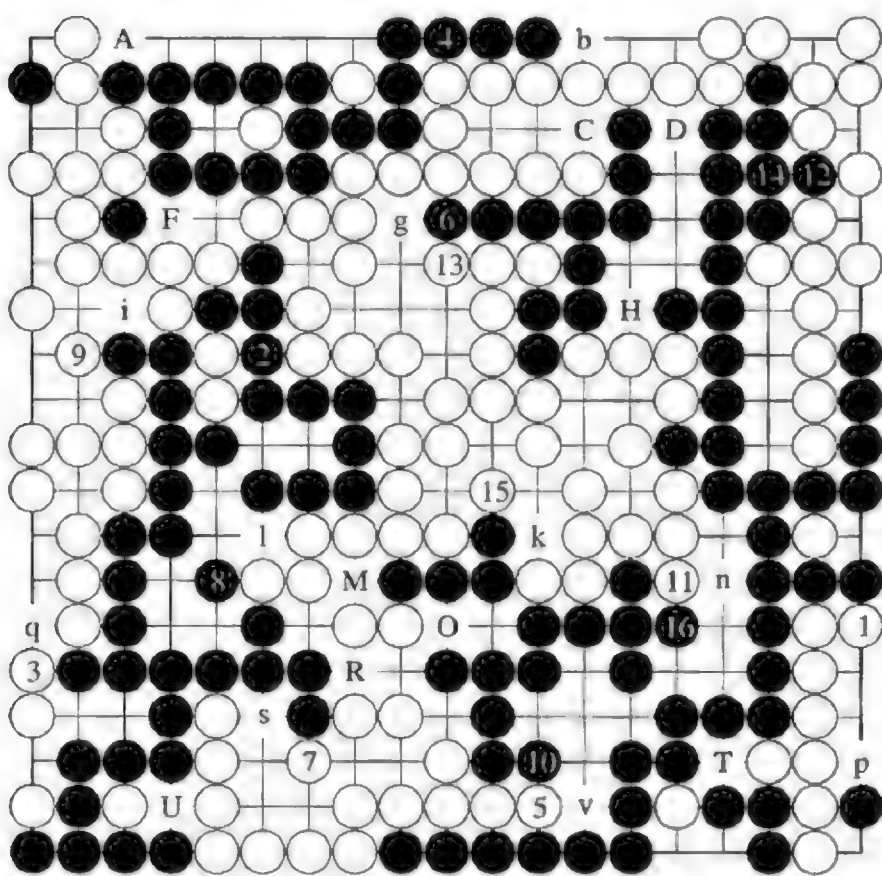
The totals of other columns are computed by the same method. From the bottom row, we deduce that the moves followed by question marks in columns III, IV and V are sub-optimal.

Although the difference between column II and column I is infinitesimal, $\{0 \mid \dagger\}$ is

positive. Furthermore, Black gets the next (tepid) play in column II, whereas White gets the next (tepid) play in column I. So column II is decidedly better for Black than column I.

This completes our discussion of Table 2 and its conclusion, which is that for the first 16 moves, an optimal canonical line of play is as shown in Figure 3.

Figure 3: Canonical Play of Hot Regions:
Moves from 1 to 16



VERIFICATION OF ROBUSTNESS

Before continuing with any further play, we now pause to verify that the dominant column of Table 2 is unaffected by the removal of all of the simplifying assumptions we have made so far. Each of our simplifying assumptions is now seen as a "nit" to be picked out. In any problem of this type, we hope that our intuitive assumptions are benign in the sense that our conclusions survive their extraction. If this proves false, then the "nit" is no longer a nit, but a cause to redo the prior partitioning and calculations in a more accurate way, even if that entails a significant increase in complexity.

Many Go players may find our nitpicking attention to mathematical detail distasteful. We view it as a small price to pay for the rigor that results.

There are two basic types of NITS:

Some sets of adjacent regions are dependent.

Some incentives in the top part of Table 1 are not quite strictly ordered.

In the present pair of problems, we have thus far included five nits:

NIT1: Q and I are dependent

Let Q and I be the independent idealized regions obtained by immortalizing the string of 6 white stones just below the letter "I" and let W be the actual region which is the union of these regions, including the string of 6 white mortal white stones between them.

Then, by playing the difference games, it can be verified that

$$W \geq I + \{2\{- | 0^2\} | -2\downarrow *\}$$

and that

$$W \leq I + \{2\{- | -2\downarrow *\}.$$

Hence,

$$W = I + \{2ish | -2\downarrow *\}.$$

So no errors result from setting

$$W = I + Q$$

if Q is taken as $2ish | -2\downarrow *$.

NIT2: N and V are dependent

There is a slight interaction between the regions N and V shown in Figure 1. For example, in the presence of O^{RL} , the chilled value of $N^{RL} + V^{RRR}$ is $\uparrow$ instead of the value implicit in Table 1, which is $1/8$. This nit is closely related to NIT 3.

NIT3: $\Delta(N)$ not strictly less than $\Delta(V^R)$

Let N and V be the independent idealized regions obtained by immortalizing the black string just left of N and just above V;

let X be the actual region which is the union of these regions, including the mortal black stones between them. We have seen that

$$\begin{aligned} N &= 0 \mid \uparrow_1 \parallel - \frac{7}{8} \mid -1 \\ V &= 2 \parallel \mid 0 \mid \uparrow_1 \parallel - 1* \\ X &\leq V + N. \end{aligned}$$

But, by playing the difference game, it can be verified that

$$X \geq V + Y,$$

where $Y = 0 \mid \uparrow_1 \parallel - 1 \uparrow \mid -1$. We notice that $\Delta(V^R) > \Delta(Y) > \Delta(N)$ from which we conclude that all plays on X will be taken in the same order as the corresponding plays on $V + N$. This eliminates the concern of NIT3.

To address NIT2, we observe that no difference can arise between X and $V + N$ unless N is played to N^{RL} , which happens only in columns I and III of Table 2. In both of these cases, V is played to V^{RL} . Under these circumstances, the $V + N$ has been played to

$$(V + N)^{RLRL} = V^{RL} + N^{RL} = \{0 \mid \uparrow_1\} - \frac{7}{8}$$

whereas X has been played to

$$X^{RLRL} = \{0 \mid \uparrow_{1\frac{1}{8}}\} - \frac{7}{8}.$$

So, the concern of NIT2 is eliminated by suppressing the subscript of the tiny which appears in V^{RL} .

NIT4: J and L are dependent

Let Z be the union of the dependent regions J and L. By careful calculation, it can be shown that, to within "ish",

$$\Delta^L Z = \Delta^R Z = \Delta Z = \{9\{\frac{5}{4} \mid -\frac{1}{2}\}\{1 \mid -1\} \parallel 0\}$$

whence

$$\{10 \mid 0\} > \Delta Z > \{9 \mid 0\}.$$

Hence, ΔZ fits into the total rank ordering of Table 2 in precisely the same position as

ΔJ . It follows that, in the dominant line of play, Black move 2 will change Z to

$$Z^L = J^L + L,$$

because J^L and L are independent.

NIT5: T and P are dependent.

Mathematically, this dependence is relatively trivial. It affects only the subscript of the tiny value at T and thus has no affect on Table 2.

However, this dependence underlies a very interesting opening move: White 1 at T. Although Black can then win, her chilled margin of victory is only infinitesimal and so great care is required. Black can play 2 at T^R . Then play continues as in column II (delayed by 2 moves), with White 3 at P, Black 4 at J, . . . , until White plays move 13 at N. Black then plays 14 G^L . If White neglects to fill the ko on move 15, then Black plays E at move 16. She then fights the ko until she wins and fills it, attaining a bottom-line score on the hot regions of $+\frac{1}{2}$ ish or better. If instead White plays 15E, then play continues as in column II ending with a positive value on the bottom line.

Having now extracted all known nits, we now resume our investigation of how play should continue from Figure 3.

TEPID REGIONS

A general theorem in (ko-free) Combinatorial Game Theory states that one need never play a tepid move if one can play a hot move instead. This theorem suggests a natural breakpoint in endgame play, roughly corresponding to the break between the moves shown in Figure 3 and the moves shown in subsequent figures. For convenience of exposition, we assume that White continues play by eliminating the tinies at O and T at moves 17-20. In fact, these moves might occur either earlier or later.

Omitting the integer-valued markings and excepting the tinies, which have no atomic weight, the tepid regions of Figure 3 are tabulated in the following Table 3:

Table 3

Region	Value	Atomic Weight
A	$0^4 \mid \dagger$	+4
v	$0 \mid \dagger$	+1
g	$- \mid 0$	-1
q	$\downarrow *$	-1
s	$\Downarrow *$	-4
F	*	0
u	*	0

In general, if no hot moves are available, Black will strive to increment the atomic weight; White, to decrement it. To this end, Black will typically attack regions of negative atomic weight, while White will attack regions of positive atomic weight.

The total of the atomic weights in Table 3 is -1 and so White, moving first, has a relatively straightforward win.

In the Japanese rules, Black will soon resign. However, under the Ing rules there is a flaw in this analysis, which is shown in the following picture of s^{LLLL} :



Using the Ing rules or any other variation of Chinese rules, an assertive Black may hope to score a point at y . Even after White has played at z , Black may claim one point of Chinese territory at y . To uphold such a claim, Black will need sufficiently many kothreats that she can avoid filling y until after all dame are filled and White is forced to either pass or fill in a point of his own territory while the node y remains empty and surrounded by Black. So we have two different views of chilled values:

Chinese scoring with many θ 's

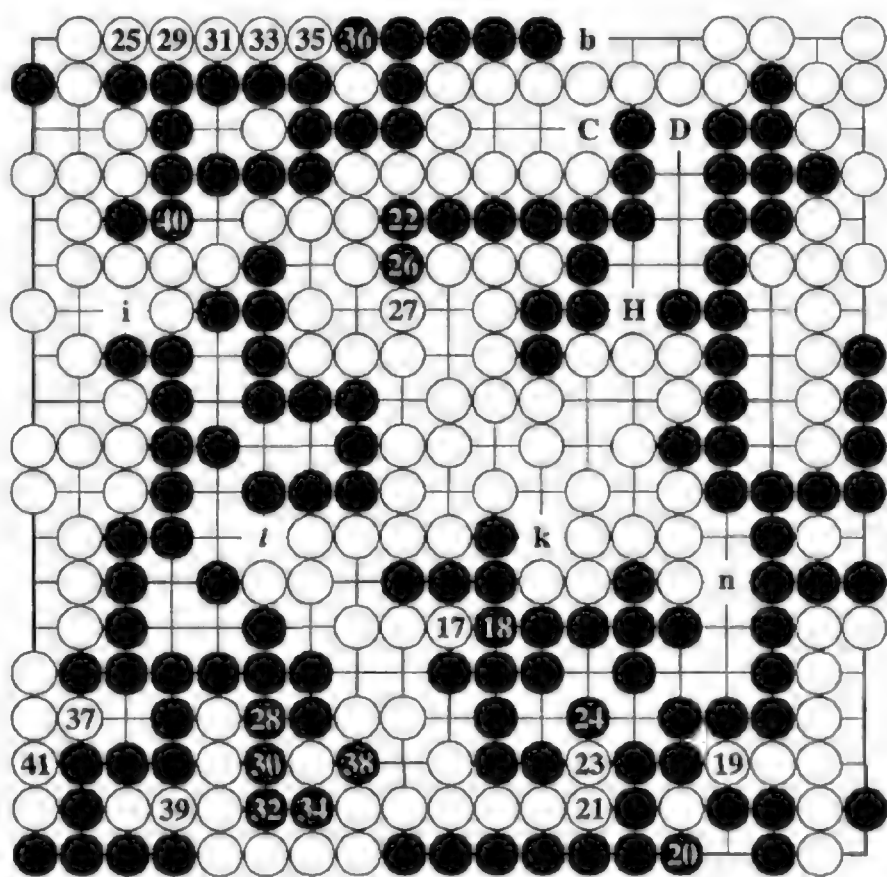
$$\begin{aligned} s^{LLLL} &= 1 \\ s &= 1 \mid 0^5 \\ &= - \mid 0^3 \end{aligned}$$

Japanese scoring

$$\begin{aligned} s^{LLLL} &= 0 \\ s &= 0 \mid 0^5 \\ &= \Downarrow * \end{aligned}$$

So, Black's best hope is to play the tepid regions under the assumption that she can win a terminal Chinese kofight. White must play to win under Japanese rules, because if White fails to win under Japanese rules, the Chinese kofight will not help him. According to a theorem of David Moews, the optimal sequence of play is given by the ordering explained in Appendix E of MG. This canonical line of play is shown in Figure 4.

Figure 4: Play of Tepid Regions: Moves from 17 to 41



The result is that

$$\{0^4 \mid \dagger\} + \downarrow * + \Downarrow * < 0$$

but

$$\{0^4 \mid \dagger\} + \downarrow * + \{- \mid 0^3\} > 0.$$

Since the subscript on the tiny in game A exceeds the subscripts in games v and g, these inequalities remain valid when applied to the sum of all tepid regions of Figure 3. No matter who plays next, Black can win the game if

$$s^{LLLLL} = 1,$$

but White can win if

$$s^{LLLLL} = 0.$$

The game should therefore continue as shown in Figure 4. Moves 21-36 all have incentive of at least $\uparrow*$. After move 36, White's view of the total value is $\downarrow$, from which White can win only by playing at 37, because it is the only move on the board with incentive $\downarrow$. Black's 38 is hot in her view, but in White's view the incentive of Black's move 38 is only $*$. Moves 39, 40 and 41 are all stars.

White's 41 is the last tepid move. This milestone of play occurs at the conclusion of Figure 4 and the start of Figure 5. The number avoidance theorem mentioned on page 48 of MG ensures that this same milestone occurs in all well-played combinatorial games.

PLAY OF NUMBERS

The seven regions which remain active at the conclusion of Figure 4 all have values which are numbers. Subsequent play on each of these numbers can effect not only its mathematical value, but also the kothreats available for the Chinese kofight that will occur later. In this kofight, dame will prove helpful to White. The number of such dame can depend on how the numbers are played. For example, consider a marked and chilled position such as

$$n^{RR} + C^L = \frac{1}{2} - \frac{1}{2} = 0.$$

Either player, moving second on this pair of regions, can ensure that the total score is

zero. However, the player who moves first can control the number of pairs of dame. If White goes first, he plays on C^L , thereby obtaining one pair of dame. If Black goes first, she also plays on C^L , thereby preventing any dame. Evidently, C^L is a number on which both players are *eager* to play; n^{RR} is a number on which they are *reluctant*. Typically, since White desires dame and Black dislikes them, numbers with positive values will be eager and numbers with negative values will be reluctant. However, local configurations can make exceptions to this rule, as happens in position i. Even though its value is $-1/2$, both players are *eager* to move there. That is because if Black manages to play to i^{LL} , she acquires two kothreats along the left side. So Black desires to move on i in hopes of progressing toward that goal and White desires to move on i in order to stop her. The numbers are thus partitioned as follows:

Eager Numbers:

$$\begin{aligned} \text{DH} &= 1/8 \\ \text{n} &= 1/8 \\ \text{l} &= 1/4 \\ \text{i} &= -1/2 \end{aligned}$$

Reluctant Numbers:

$$\begin{aligned} \text{b} &= -1/4 \\ \text{C} &= -1/4 \\ \text{k} &= -1/2 \end{aligned}$$

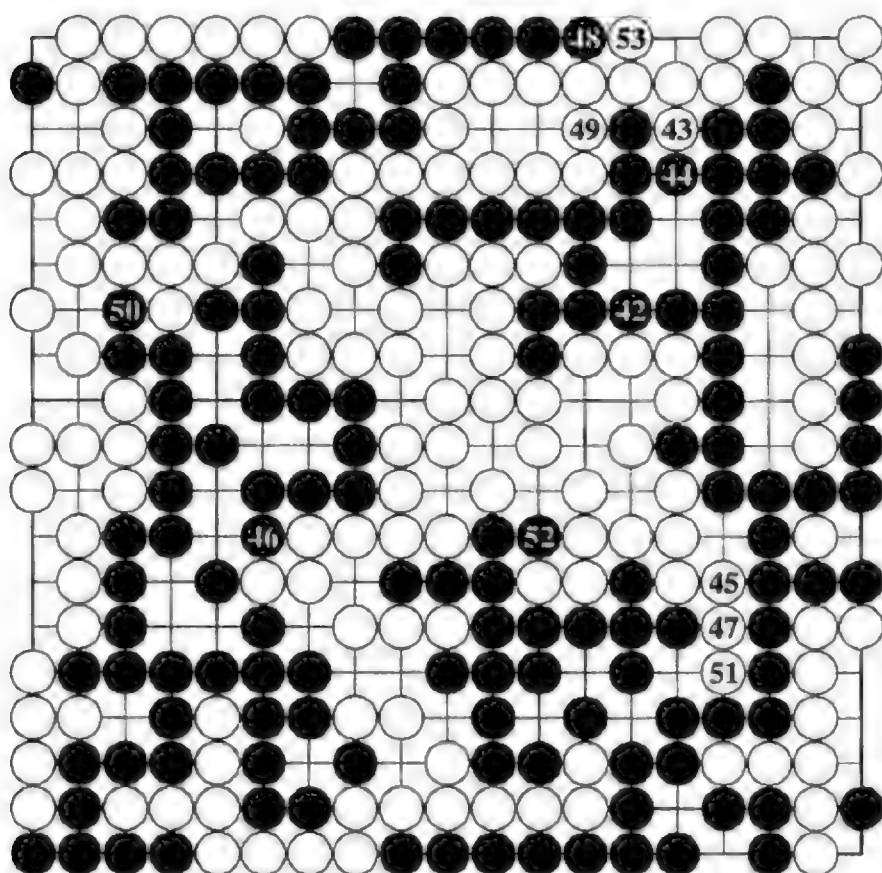
This tabulation provides the rationale for the sequence of play shown in Figure 5. Notice how the incentives decrease monotonically as play progresses:

Formal Incentive	Moves
Eager -1/16	42-43
Eager -1/8	44-45
Eager -1/4	46-47
Reluctant -1/4	48-49
Eager -1/2	50-51
Reluctant -1/2	52-53

By partitioning the eager and reluctant numbers into separate subsystems, each of which sums to an integer, White can play each integer independently and thereby ensure that he gets at least one pair of dame. However, Black gets everything else. At each turn, she gets to choose among at least two alternatives and White is then forced to take whichever is left over. Black blocks a potential White kothreat by playing at 46 rather than at 47. Black's move 50 gives her the opportunity to play 58 later in Figure 7.

If White plays 47 at 48 or 49, or if he plays 51 at 52 or 53, then there would be two fewer dame at the conclusion of play. In Figure 5, any of these errors would cost White the game.

Figure 5: Play of Numbers: Moves from 42 to 53



Move 53 marks the end of the game in Japanese scoring, but in Chinese scoring, lots of action remains.

THE CHINESE KOFIGHT

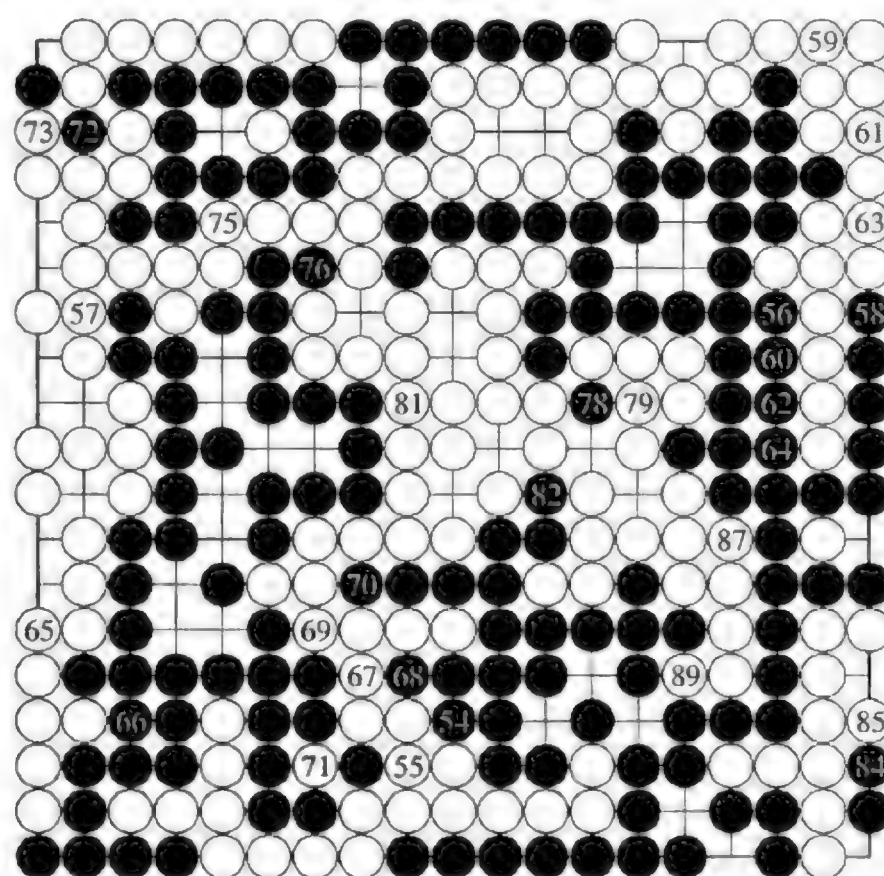
Figure 6 shows one correct line of play for the completion following Figure 5, in which each player strives to win the game but ignores the secondary issue of how many moves are played until the game ends.

The readers who are familiar only with

Japanese scoring should begin by studying the final stage of the fight, which begins after move 70. As White takes the ko at move 71, Black has 3 kothreats, but White has 6 dame. Each pair of dame provides a kothreat for White. After White's move 87, Black has no kothreats. Only one dame remains, but if Black plays it, then White wins the ko which gives him a margin of victory of 3 points. So Black fills the ko at move 88 and White then fills the last dame to win the game by one point.

Suppose that there were no dame at locations 75 and 81 and that the last dame was filled by Black's move 83. In that case, after Black's ko capture at move 85, White could do no better than pass and Black would win the game by one point.

Figure 6: Play of Chinese Ko: Moves from 54 to 89



71, 74, 77, 80, 83 and 86: Take the Ko
88: Fill the Ko

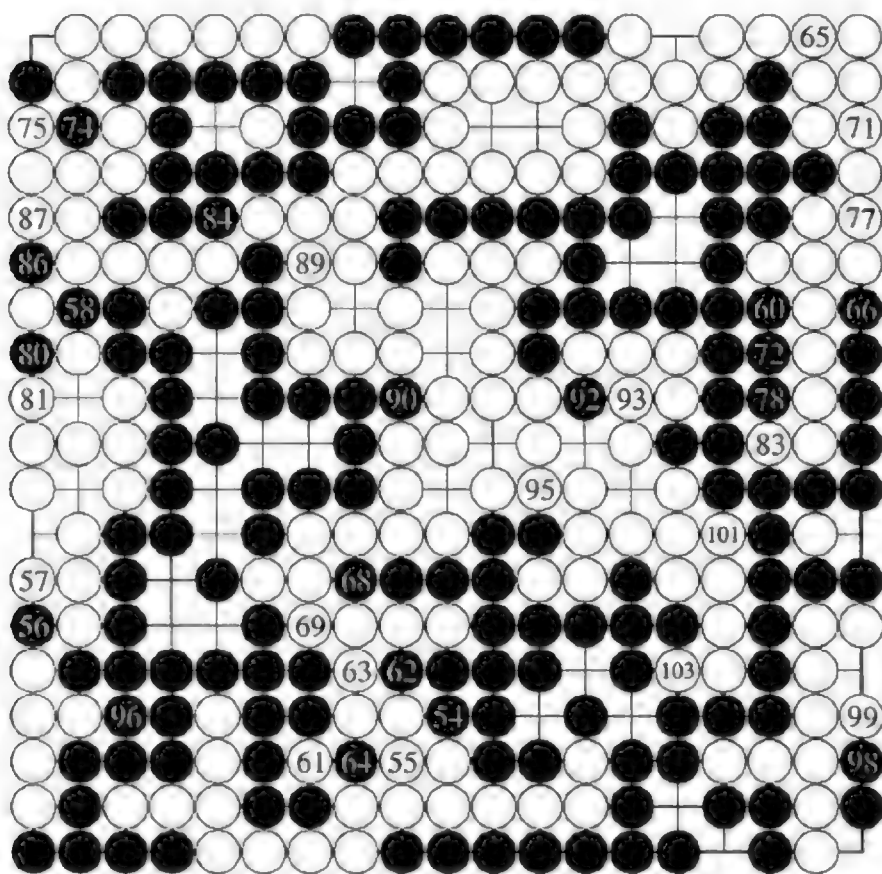
The unusually wide variety of kothreats and potential kothreats shown in Figures 4 or 5 makes this a surprisingly interesting game. The mathematical tools to handle such games are still being developed and so the reader may enjoy working out the present problem by the traditional Go-playing method of reading out the various

lines of play.

It is somewhat surprising that each player can play this portion of the game in several different ways, all of which lead to equivalent results. From the position shown after move 53 in Figure 5, White can win. However, if this position contains two fewer dame, then Black could win. The variation of the position which contains two fewer dame might arise either because the starting position was Problem 2 rather than Problem 1, or because in Problem 1 White failed to play the numbers on moves 42 to 53 with sufficient care.

Either player can elect to prolong the Chinese kofight.

Figure 7: Black Stalls His Loss: Moves from 54 to 103



59 at 56

64, 67, 70, 73, 76, 79, 82, 85, 88, 91, 94, 97
and 100: Take the Ko

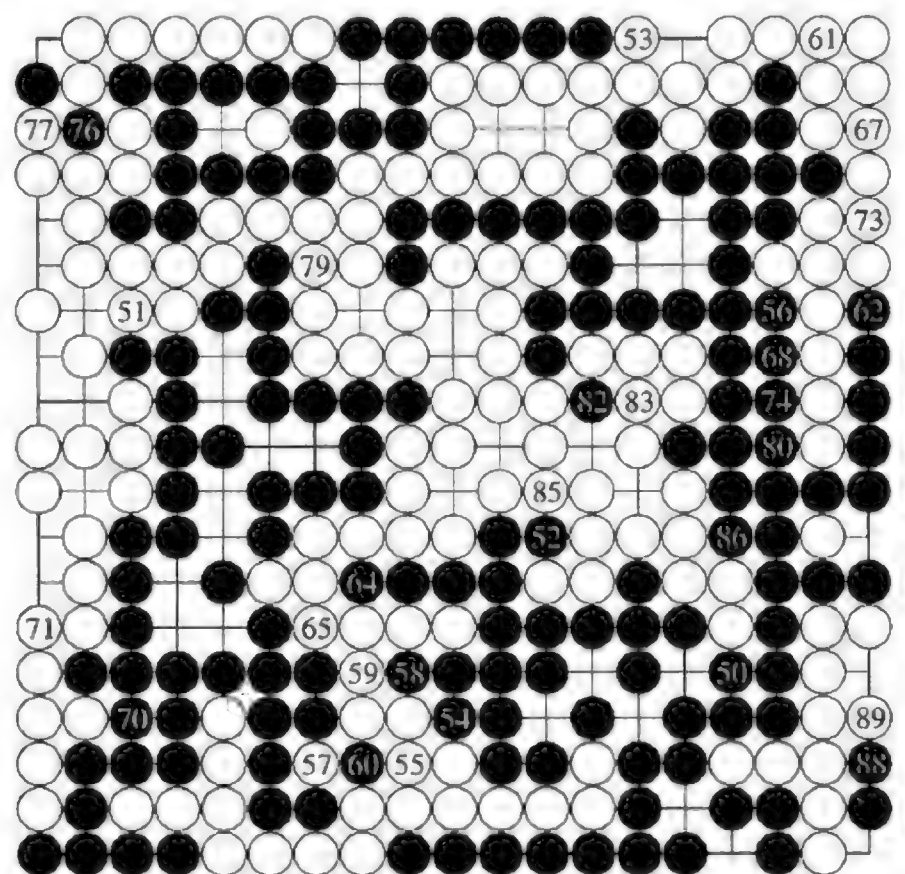
102: Fill the Ko

Figure 7 shows a variation in which Black, unable to win, forces White to play until move 103. This line of play includes Black's surprising move 56, which sacrifices a kothreat prematurely in order to lengthen the game. A slightly less brilliant line of play by Black would eliminate moves 56 and 57, leading to a White win after 101

moves instead of 103.

Figure 8 shows a conclusion to Problem 2, in which Black can prevail, but apparently no sooner than move 90. To achieve this rapid victory, Black deviates from prior lines of play at move 50. There are other ways in which Black can attempt to expedite his victory by deviating from canonical play, but we think that none of them succeed. For example, if Black postpones playing at 22 until after he has played at 38, then White can play at 41 instead of at 37, after which Black cannot win because his early kothreat never materializes.

Figure 8: Black Wins Problem 2 Quickly: Moves from 50 to 90



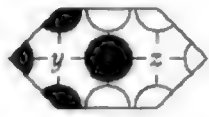
57, 60, 63, 66, 69, 72, 75, 78, 81, 84, 87
and 90: Take the Ko

THE \$1,000 DAME

It is tempting to think that all of our prior analysis of Problems 1 and 2 should also apply to Problems 3 and 4. Canonical play for the first 53 moves is indeed the same for all four problems. Reading further ahead, it is very plausible to foresee the same Chinese kofight. Eventually, the number of Black's threats will exceed the number of pairs of dame and so for several weeks we believed that Problem 4 behaved like Problem 2:

Black should win in about 90 moves.

However, Kuo-Yuan Kao then pointed out a fatal flaw in this reasoning, which originates at s^{LLLLL} :



If White plays at "z", while other "dame" remain on board, then Black has enough kothreats to fight and win the Chinese ko at "y". Eventually, White runs out of other dame to fill and he is forced to pass or fill in his own territory. Only after White has done that can Black afford to fill "y" and still win the game.

Mathematically, after Black plays "y" and "z" remains vacant the unchilled value is $*$. But, after White plays "z" and "y" remains vacant, then if Black can win the Chinese Ko, its unchilled Chinese value is 1. So the original position just shown has unchilled value equal to

$$\{ * \mid 1 \} = 0.$$

This equation reveals how White can win Problem 4. After canonical play through move 53, he should refuse to play at "z". Black and White both play dame elsewhere until no other dame remain. White then has no kothreats and Black has many, but they do her no good, because both "y" and "z" are still vacant and there are no other dame anywhere else on the board. On move 73, White fills the last dame elsewhere. If Black then fills "y", White fills "z" and wins by one point. If Black passes at move 74, White fills "z" and still wins by one point in Ing scoring. Black gets her point at "y" (either filled or unfilled), but she still loses the game.

So, thanks to the \$1,000 "false dame" at "z", we believe that White wins Problem 4. If he plays canonically for the first 53 moves, he eventually fills the last dame on move 75. But Black then prolongs the game another

10 moves by playing out each of her five kothreats.

Problem 3 is an easier version of Problems 1 and 4.

The same argument reveals why, in Problem 1, in Figure 6 Black cannot afford to play Black 54 anywhere else. If instead she played Black 54 at 57, White could play 55 at 54 and then refrain from playing at 55, thereby winning the game by avoiding the Chinese kofight.

THE NON CANONICAL SURPRISE

Virtually all of the contestants in Ishi's Thousand Dollar Ko competition made fatal mistakes on early moves. But among these weak lines of play, two contestants uncovered a real gem:

$$1P, 2J, 3Q, 4B, 5S!$$

From the partial order chart at the right of Table 2 on page 69, this looks hopelessly wrong. After all,

$$\Delta S < \Delta G < \Delta V.$$

So we played the continuation, 1P, 2J, 3Q, 4B, 5S, 6V, 7G and reached the same position that might also have arisen from 1P, 2J, 3Q, 4B, 5G, 6V, 7S. This less dramatic sequence focuses our attention on an intriguing inequality,

$$\Delta G < \Delta V,$$

whose truth depends on both of the following true assertions:

$$2\frac{5}{8} < 3 * \quad \text{and}$$

$$\{\frac{1}{2} \mid 0 \parallel 0\} = -\frac{1}{2} < -1 = \{1 \mid 0 \parallel 0\}.$$

So this line is definitely *not* canonical. White's 5G is dominated by the canonical 5V. However, our investigations of continuations of this sequence soon led to the extension of Table 2 shown in Table 3 within "ish":

Table 4: An Extension of Table 2

	Δ	VI	VII	VIII
B	$3\frac{3}{4} 0$	4	4	4
V	$3 2 0$	6	6	6
G	$2\frac{5}{8} 2 0$	5	5	5
L	$1\frac{3}{4} 0$	8	8	8
I	$1\frac{1}{2} 0$	9	9	9
V^R	$1 0$	-	-	-
N	$1 \frac{7}{8} 0$	11	20	10?
G^L	$\frac{5}{8} 0$	-	-	-
K	$\frac{1}{2} 0$	13	22	11
N^R	$\frac{1}{8} 0$	14	-	-
S	$1\frac{1}{2}\theta\theta 0$	7	7	7
E	ko	10	10	12
T	$-\Delta\theta$	-	11?	13
kofill		12	21	23
Totals		0	$\frac{3}{8}$	$-\frac{1}{8}$

The canonical continuation after 5G 6V is evidently as shown in column VI. After the hot games are played, the value is 0-ish. From Table 2, the difference between the precise values at the bottom of column VI and column I is

$$\{-1 | 0\} + \{0 | \nmid_{1/2}\} > 0.$$

It is easy to see that this infinitesimal difference, of atomic weight zero, evaporates near the beginning of the tepid phase of play. The continuations of columns VI and I quickly converge to the same plays of regions A, s and q, the same careful play of numbers and the same Chinese kofight. Additional study verifies that there is no difference in Chinese kothreats or dame. The only difference is that White gets there 8 moves sooner via the line of play shown in column VI. So, if White seeks to win as quickly as possible, column VI is his best opening for Problem 1. To stall his defeat in Problem 2, he should open instead as in column I. Black has a superb response to those White contestants who played the surprise opening to Problem 1:

1P, 2J, 3Q, 4B, 5S! 6G!!

To address the question of whether this problem has any other surprise openings, one can re-examine the partial ordering of incentives shown at the right of Table 2. The inequalities shown in this diagram may be partitioned into strong inequalities and weak inequalities, where an inequality of the form $\Delta W < \Delta X$ is *strong* if there exist numbers y and z such that;

$$2.\Delta W < y < z < 2.\Delta X.$$

An order of play which transposes two consecutive moves related by a strong inequality is not only non-canonical; it loses the game. So the search for more winning non-canonical lines of play must violate only weak inequalities in the partial order to the right of Table 2. The only inequalities which might be weak are these:

$$\begin{array}{ll} \Delta V & > \Delta G \\ \Delta S & > \Delta I \\ \Delta V^R & > \Delta E \\ \Delta V^R & > \Delta N \\ \Delta E & > \text{ishes} \\ \Delta E^L & > \text{ishes} \end{array}$$

The player who is destined to lose the game anyway is less constrained; he might try very strange moves to prolong the play.

Although most non-canonical moves lead to quick defeats, the number of possibilities is substantial and we have not attempted a complete search or further arguments which might greatly reduce the size of the requisite search.

CONCLUSION

Mathematical Go includes a collection of powerful techniques for rigorous analysis of intricate endgame positions, including the four problems at the beginning of this paper. The techniques of Mathematical Go provide a "canonical" line of play, which leads to a best-possible score. If any strategy can win, then the canonical strategy will win. In the problems considered here, a search of only

five lines of play, summarized in Table 2, was sufficient to determine that White wins Problems 3 and 4. The same analysis shows that the outcome of Problems 1 and 2 depends on a Chinese kofight at $S^{RLLLLLR}$. This location, not E, is the "Thousand Dollar Ko". The mathematics proves that, against a determined opponent, neither player can win Problem 1 or Problem 2 without creating this ko and then winning it.

However, the mathematical techniques used in our analysis of hot and tepid games do not say anything about the number of pairs of dame remaining, nor about the number of moves required to conclude the game. Since the outcome of the Chinese kofight depends on the number of dame, we are not even completely sure who can win! It is conceivable that still other non-canonical lines of play not yet discovered might leave more or fewer pairs of dame on the board when the crucial kofight at $S^{RLLLLLR}$ begins. But based on everything we know, we now think that

White wins Problem 1 by one point after 95 moves.

Black wins Problem 2 by one point after 90 moves.

White wins Problem 3 by one point after 79 moves.

White wins Problem 4 by one point after 77 moves.

Readers who yearn for another problem of this type will enjoy Figure C. 19 of **MG**, which White wins in 101 moves. The software companion contains a degenerate version of this problem, just as Problems 3 and 4 above are degenerate versions of Problems 1 and 2.

REFERENCE: "Mathematical Go: Chilling Gets the Last Point", [hardback] 1994, by Elwyn Berlekamp and David Wolfe, AK Peters, Ltd., Wellesley Mass.

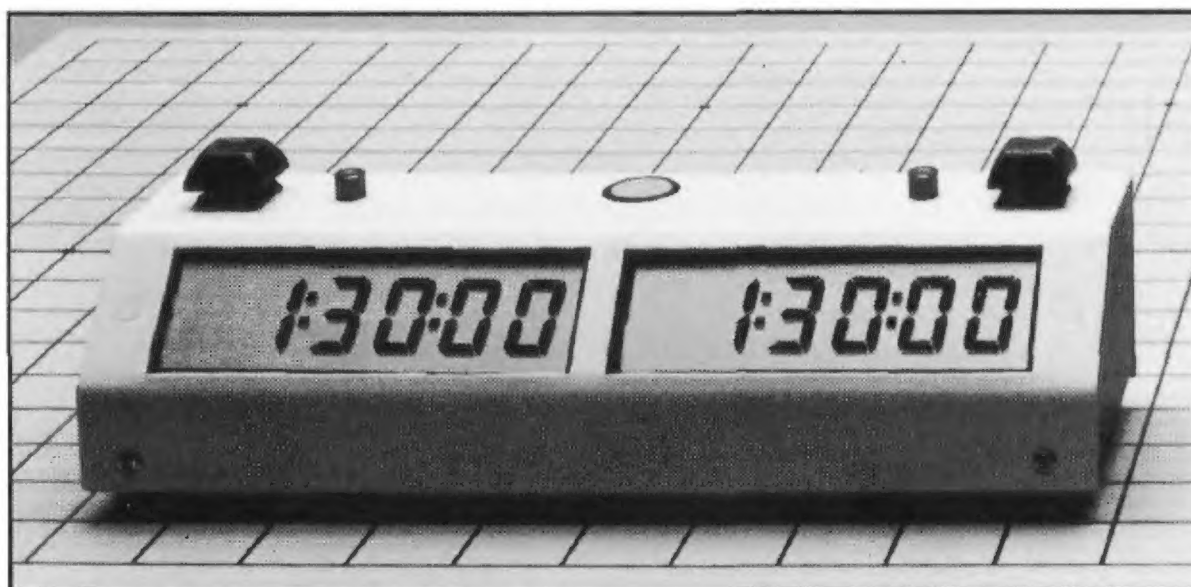
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